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ESPC4 and PERM 20-22 June 2022 hybrid online and Vienna, Austria

Nearly 300 participants are now confirmed for Vienna and online, 20-22 June, for ESPC4 (4th European Sustainable Phosphorus Conference), PERM (Phosphorus Research in Europe Meeting) site visit and young researchers networking event.

If you can't make it to Vienna, register to participate online, now.

All plenary sessions and 4 (of 12) parallel sessions will be online (see programme).

We will be using SWAPCARD to enable contacts and networking between all online and in-person participants (accessible after registration only), one chat & forum for the whole event enabling questions, discussion and exchange of information, as well as your own profile, programme, access to session recordings after the event ...

Confirmed speakers include the European Commission (DG Environment, DG GROW, DG Research, CINEA), international organisations, leading companies, scientists and stakeholders.

Registration: https://phosphorusplatform.eu/espc4









EU consultations

EU consultation on nutrient management (INMAP)

Public consultation, open to 15th August 2022, asks for opinions and proposals on nutrient policies, fiscal and regulatory tools, and on nutrient recycling. General questions ask for input on which impacts of nutrient pollution are important, different actors involved and links to other environmental challenges, including climate. Input is requested on what should be the key actions and policy tools (e.g. fiscal policy,

financial incentives ...), consumer actions (e.g. dietary choices) and whether INMAP should address nutrients other than N and P. A section on nutrient recycling asks to identify obstacles to recycling (e.g. cost, regulation, contaminants ...) and priority actions to support nutrient recycling (e.g. targets, taxes, enforcement of legislation ...). Supporting documents or proposals can be submitted. See summary of INMAP workshop below. INMAP will be presented at ESPC4, 20-22 June, register now online. EU public consultation on INMAP, "Nutrients – action plan for better management", open to 15th August 2022, HERE.

EU consultation on sustainable food production

EU public consultation, open to 21st July 2022, "Sustainable EU food system – new initiative". See ESPP eNews n°66 and HERE.

EU consultation on Environmental Liability

"Environmental Liability Directive (evaluation)", public consultation (questionnaire) to 4th August 2022. See ESPP eNews n°66 and HERE.

EU consultation on Waste Framework Directive and food waste

Public consultation, open to 16th August 2022, asks for opinions objectives and possible policies for waste reduction, recycling and reuse, food waste, separate collection. Questions address opinions on general consumer behaviour concerning waste prevention and waste management and links to product purchasing, priorities, separate collection of different household wastes and consumer sorting, tools such as producer responsibility or economic incentives. Specifically for food waste, question concern policy priorities, stakeholders, obstacles to food waste reduction and possible policies to reduce food waste, including surplus food redistribution, packaging, best-by dates, monitoring, education or fiscal incentives, legally binding waste reduction or reuse targets,

EU public consultation, open to 16th August 2022, "on the revision of the Waste Framework Directive". One consultation with two different access pages: "Food waste – reduction targets" <u>HERE</u> and "Environmental impact of waste management – revision of EU waste framework" HERE.

ESPP new members

Borealis L.A.T. will present cooperation with Vienna on P recycling at ESPC4

Regional wastewater treatment plants and regional fertilizer manufacturers in cooperation: closing the cycle in nutrient management.



A member of the Borealis Group

Borealis L.A.T. operates combined NPK and calcium ammonium nitrate fertiliser plants at its location in Linz, Austria. The highly efficient Odda process (nitrophosphoric acid route) is designed to use more than 100,000 tons of secondary lime avoiding waste and unnecessary by-product creation. Borealis L.A.T. has entered into a nutrient recovery partnership with Vienna municipality. In a multi-partner cooperation, ash from sewage sludge mono-incineration will be used as raw material providing value able recovered phosphor for high quality fertiliser production. Successful large scale technical trials show that the ash can be used in product of high quality fertilisers, and that logistics are safe. Challenges remain in the regulatory approval process and appropriate go-to-market approaches for recovered nutrient products.

Borealis L.A.T is a well-known partner of European agriculture, together with millions of farmers constantly striving for better yields and higher quality crops at reduced ecological footprint. Based on the concept of Nitrogen Use Efficiency, Borealis L.A.T provides farmers with directly plant-available fertilizers and digital services for efficient use of plant nutrients, like NutriGuide® - fertilisation planning according to crop rotation principles and actual nutrient requirements; NutriZones® - precise, site-specific nitrogen spreading based on satellite maps; N-Pilot ® - measuring plot-specific nitrogen demand and delivering fertilisation advice within a few minutes.

https://www.borealis-lat.com/



VaLoo: the newly founded Circular Sanitation Network Switzerland.



VaLoo is the newly founded circular sanitation network Switzerland. The network exists of startups, companies, researchers, farmers and individuals that dream of a world where VALue is created form what normally ends up in the LOO. VaLoo's members collaborate to promote and facilitate the implementation of resource - oriented sanitation in Switzerland. In recent years, many innovative solutions are being tested and implemented that can

recover nutrients from toilets for save reuse in agriculture. In order for these technologies to scale up and flourish, fertilizer regulations must include human excreta as a component material category(CMC) for fertilizers. Through our expertise, we hope to add to the ESPP mission for sustainable cycling of phosphorus as well as other nutrients via circular sanitation.

www.va-loo.ch

Call for abstracts



7th Sustainable Phosphorus Summit (SPS7) 1 – 4 November 2022, North Carolina

SPS is the world academic and research conference on phosphorus sustainability, and will take place with the US phosphorus Week (US SPA, STEPS), 1-4 November 2022.

Call for abstracts for SPS open to 15th July 2022.

Previous SPS have taken place in Brazil 2018 (<u>SPS6</u>), China 2016 (<u>SPS5</u>), France 2014 (<u>SPS4</u>, see <u>SCOPE108</u>), Australia 2012 (SPS3, see <u>SCOPE85</u>), USA 2011 (<u>SPS2</u>) and Sweden 2010. Co-hosted by the <u>STEPS Center</u> (US Science and Technologies for Phosphorus Sustainability) and the US <u>Sustainable Phosphorus Alliance</u>, SPS7 (3-4 November 2022) and the US SPA annual <u>Phosphorus Forum</u> (1-2 November) in Raleigh, North Carolina

Call for abstracts <u>HERE</u> for Sustainable Phosphorus Summit 2022, US Phosphorus Week (1-4 November, North Carolina) including SPS7 and US SPA Phosphorus Forum: https://phosphorusalliance.org/phosphorus-forum/

EU Integrated Nutrient Management Action Plan (INMAP)



EU Commission workshop says current nutrient policies not sufficient

Participants underlined that nutrient recycling is needed to address food and fertiliser security, and pointed to soil health, nutrient controls in the CAP, sewage recycling, and to dietary change as the primary driver for nutrient demand.

The European Commission workshop "Towards a Zero Pollution Monitoring and Outlook" (24-25 May 2022), included a half day on integrated nutrient assessment and INMAP (the EU's proposed Integrated Nutrient Management Action Plan), with around 20 participants in Brussels and around 130 online. The workshop discussed policies needed to achieve the EU Green Deal (Farm-to-Fork and Biodiversity Strategies) target to reduce nutrient losses by -50% by 2030, and monitoring and indicators needed to support this target for decision makers, industry and stakeholders.

Joachim d'Eugenio, Jeanne De Jaegher, Christophe Didion and Andrea Vettori, European Commission DG Environment, reminded that INMAP aims to define and engage actions, across all EU policies and with Member States, to achieve the Green Deal objective of reducing nutrient losses by 50% by 2030. The EU's nitrogen and phosphorus emissions currently exceed the European share of the Planetary Boundaries by x 3.3 and x 2 respectively. The war in Europe and its impacts on fertiliser supply, phosphate rock resource supply and food affordability, increase pressure (see the Commission communication on "Safeguarding food security", 23/3/2022, summarised below). DG Environment pointed to the <u>public consultation on INMAP open to 15th August 2022</u>, indicating that input is looked for on which policies and actions are need and on defining priorities.



INMAP will address:

- · integrated approach on nutrient pollution encompassing air, water, soil and climate
- sustainable application of nutrients
- nutrient pollution at source
- · sustainability of agriculture and other sectors
- nutrient pollution hotspots and livestock production
- nutrient recycling
- shortcomings in specific legislations on nutrients and implementation gaps

Andrea Vettori will present the proposed EU Integrated Nutrient Management Action Plan (INMAP) and answer participants' questions at ESPC4, 20-22 June, register here https://phosphorusplatform.eu/espc4

Bruna Grizzetti and Diego Macias Moy, European Commission Joint Research Centre (JRC), presented the wide range of work underway in JRC modelling nutrient losses and possible reductions in losses achievable through different policy options.

JRC estimates that around 50% of nitrogen (N) and 40% of phosphorus (P) entering the food production system in the EU is lost to the environment (in both cases, around 10% of inputs ends up in food waste). Grizzetti et al. 2021 (see ESPP eNews n°55) concluded that implementation of current EU policies could reduce N losses to European seas by -14% and P losses by -20% only, that is not achieving the Green Deal -50% target. Modelling underway suggests that additional N and P reduction are possible with additional measures. **Recycling of phosphorus could cover 25% of agricultural inputs**, so making a significant contribution to the Green Deal nutrient reduction target by transferring phosphorus from regions with excess (livestock production) to regions with crop needs, but this is estimated at only 10% for nitrogen.

For nitrogen, modelling suggests that a reduction of N fertiliser application in N-surplus regions and an increase in regions with low soil N would result in a 6-7 % reduction in EU total fertiliser consumption and N losses with no overall loss to production. Enhanced implementation of sewage treatment could reduce N loses by 8%, climate policies under Fit-for-55 (N losses to air) by 11% and ambitious agricultural policies by 11%.

JRC underlines that even such ambitious scenarios for application of existing EU policies, taken together, remain inadequate to achieve the Green Deal -50% loss reduction target. Action is therefore needed on dietary change, extending Organic Farming and connecting livestock to crop production, with a food security aim of zero import of animal feed.

JRC noted that nutrient reductions and policy applications need to be **region-specific**. Concern was also expressed that **reducing nitrogen losses more than phosphorus losses could lead to blue-green cyanobacteria blooms** (replacing diatoms).

lan Marnane, European Environment Agency, proposed for discussion various indicators for monitoring nutrient management, based on existing data sources, including algal blooms, nutrient levels in surface waters and Water Framework Directive quality status, consumption of mineral fertilisers, ammonia losses to air from agriculture and other sectors (Emissions Ceilings Directive). He noted the need to also develop cross-cutting indicators, concerning nutrients in food, health and ecosystems (to be defined).

Participants suggested that **indicators should specifically address recycling**, for example using Circular Economy and Critical Raw Materials indicators, see the EEA report "Sewage sludge and the circular economy", May 2021, in <u>ESPP eNews n°58</u>. Roll-out of more efficient fertilisers offers potential, e.g. with nitrification inhibitors. The interest of the existing **Nitrogen Use Efficiency** indicator (<u>EU Nitrogen Expert Panel 2015</u>) was noted, with the question how to extend this to Phosphorus Use Efficiency?

The need to harmonise Member State reporting on nutrients (agriculture, sewage, industry) was underlined by The Netherlands. The European Commission noted that some Member States are not reporting nutrients to Eurostat, and that it will be proposed to make this reporting obligatory.

In workshop discussion, the importance of the **Common Agricultural Policy (CAP)** was emphasised. DG Environment indicated that although the proposed "FaST" (Farm Sustainability Tool for Nutrients, that is calculation of farm nutrient balances) has not been made obligatory for all farms, it is part of the CAP Advisory Service (see revised CAP <u>2021/2115</u> art. 15(4)g) and is now available online. Member States' CAP Strategic Plans will be required to be "Green Deal" conform (including the -50% overall EU nutrient loss reduction target). Also, farm nutrient balances will be progressively required for all farms in Nitrates Directive 'Vulnerable Areas' under Nitrates Directive Implementation Programmes. ESPP notes that this raises the question of whether balances will also be required for phosphorus?

Discussion emphasised the importance of **reducing contaminants at source in sewage sludge**, to facilitate nutrient recycling, and the potential for phosphorus recycling from **animal by-products** (in particular, meat and bone meal ash), whilst guaranteeing safety. DG Environment indicated that the revision of the Sewage Sludge Directive (see <u>ESPP eNews n°51</u>) aims to reduce pollutants both at source entering sewage and going to agricultural land, in coordination with other EU actions (such as the proposed Green Deal ban of PFAS/PFOS Directive, see <u>ESPP eNews n°49</u>). Discussions are also engaged to **possibly reduce the 50 mg/l nitrates limit in drinking water** (EU Drinking Water Directive 98/83).

Participants also discussed **how to develop nutrient recycling**. **Anders Finnson**, **Swedish Water and Eureau**, asks for a "recycled nutrient quota" in fertilisers placed on the market, to drive demand for secondary nutrients. **Cecilia Dardes**, **Fertilizers Europe**, indicated that the industry is favourable to nutrient recycling, that around half of nutrient inputs to EU agriculture are already recycled (especially manure) but that around half of our food production is dependent on mineral fertiliser inputs.

For Liisa Pietola, MTK Finland and Copa-Cogeca, farmers need recycled fertilisers which they can use efficiently, which are compatible with their existing spreading equipment and which do not contain substances which may harm soil ecology.



The European Commission DG Environment concluded the workshop by underlining the need to identify economic and efficient actions, by **improving resource efficiency for nutrients**, crucial in the current context of food insecurity. The link to soil health was emphasised, and the **proposed EU Soil Health Directive** (EU consultation March 2022, see <u>ESPP eNews</u> n°64) will address the functions of soil for food production, biodiversity, air and water quality.

DG Environment also underlined the importance of the Member States' **CAP (Common Agricultural Policy)** Strategic Plans and the objective fixed for INMAP in the <u>Zero Pollution Action Plan</u> (SWD(2021)140 - SWD(2021)141) to use "the green architecture of the new common agricultural policy, especially via conditionality and eco-schemes" to address nutrients. The Commission will require Member States to define their own nutrient targets in their CAP Strategic Plans.

ESPP notes that the revised CAP conditions payments to farmers on respect of certain specific points (regarding water use and phosphate and nitrate pollution) of the Water Framework Directive 2000/60 and of the Nitrates Directive 91/676 (revised CAP 2021/2115 Annex III, SMRs [Statutory Management Requirements] 1, 2, 8) as well as requiring that Member States' CAP Strategic Plans should "contribute to and be consistent with" these two Directives.

The European commission concluded with the need to go across silos, to work with stakeholders in different sectors, with Member States and Commission Expert Groups, and with the importance of input to the currently open public consultation open to 15th August 2022, HERE.

EU Zero Pollution Monitoring and Outlook Workshop, 24-25 May 2022, including session on Integrated Nutrient Management Action Plan (INMAP), documents, presentations, etc HERE.

EU public consultation on INMAP, "Nutrients – action plan for better management", open to 15th August 2022, HERE.

Policy

EU reaffirms intention to act on contaminants in phosphate fertilisers

The European Commission's chemicals "Restrictions Roadmap" includes a proposed restriction under REACH of "Substances in fertilisers", targeting e.g. contaminants in phosphate fertilisers. This Roadmap is part of the Green Deal Chemicals Strategy for Sustainability and "prioritises group restrictions for the most harmful substances to human health and the environment". The possible group restriction of "Substances in fertilisers" is indicated as pending discussion on the recent European Commission study (the ARCADIS report on risks of contaminants in fertilisers, July 2021, see ESPP eNews n°61) and possibly including "contaminants in phosphate fertilisers" and "other substances intentionally used in fertilisers". Substances targeted also include PFAS (as a "group"), which is important to reduce these in sewage sludge where they are an obstacle to reuse / recycling (see e.g. "Swedish Water calls for ban on all PFAS chemicals" in ESPP eNews n°66).

"Sustainable Chemicals: The Commission advances work on restrictions of harmful chemical substances", European Commission 25th April 2022 <u>HERE</u> and SWD 2022 128 (25th April 2022) "Restrictions Roadmap under the Chemicals Strategy for Sustainability" <u>HERE</u>.

EU communication on food systems resilience and war in Europe

The European Commission recognises EU dependence on imported fertiliser, and the global fertiliser and food price crisis, and points to the need to optimise fertiliser use and develop nutrient recycling. The Communication indicates that the Common Agricultural Policy, through Member States' Strategic Plans, should support practices to optimise fertiliser efficiency, so reducing their use. Dependency of mineral nitrogen fertiliser production on natural gas should be addressed, through "clean hydrogen" and "green ammonia". Import dependency for phosphate and potassium is identified as a concern and actions to recover and reuse nutrients from manures, by-products, residues and wastes will be supported (e.g. EU Bioeconomy Strategy, Horizon Europe Circular Bio-based Europe partnership).

"Address by Mr Janusz Wojciechowski 23 March 2022 HERE.

"European Commission Communication "Safeguarding food security and reinforcing the resilience of food systems" COM(2022)133, 23rd May 2022 HERE.

United Nations resolutions recognise global phosphorus challenge

The United Nations Environment Assembly (UNEA) has again noted the importance of phosphorus in global water pollution and food security, but so far has not engaged action. In 2019 already (see ESPP eNews n°33), UNEA (part of UNEP, the United Nations Environment Programme) recognised that crop production and food security are dependent on nutrient resources and proposed to support sharing of information concerning nutrient recycling. The 2nd March 2022 resolution of UNEA on Sustainable Nitrogen Management expresses "concern that excessive levels of nutrients, in particular reactive nitrogen and phosphorus, have a significant impact on species composition in terrestrial, freshwater and coastal ecosystems ..." and recognises that "global crop and livestock production and food security depend on using nutrients sustainably and decreasing nutrient waste, including nitrogen and phosphorus". The 2022 resolution proposes the development of national action plans for sustainable nitrogen management and development of the UNEP Working Group on Nitrogen, but does not propose actions on phosphorus or other nutrients.

UNEA (UNEP) resolution on Sustainable Nitrogen Management, adopted 2nd March 2022 HERE.

EU proposes progress on ashes from Animal By-Products (ABPs), inc. Cat1 ash

The European Commission has written to ESPP that inclusion into the EU Fertilising Products Regulation of ashes from manure and certain other ABPs is underway, and that assessment of safety of Category 1 ash will be engaged.



ESPP submitted written questions to the European Commissioners for Health and Food Safety (SANTE) and for the Internal Market (GROW). The answer from the Director General of DG SANTE states inclusion of ash from (co-)combustion of manure and certain other Category 2 and Category 3 Animal By-Products is under discussion with Member States (it is ESPP's understanding that a proposed text will be presented at the Animal Health Advisory Committee meeting of 7th June). DG SANTE also writes that a mandate is under preparation to request an EFSA Opinion on the safety of Category 1 ABP ashes, preparatory to a possible regulatory text to allow use of this ash in fertilisers.

ESPP is therefore interested to receive any data, reports, references of studies or publications concerning the sanitary safety of ash from (co-)combustion of Category 1 Animal By-Products (elimination of pathogens, in particular of prions).

Animal By-Product ash in fertilisers, including Cat1 ABP ash: ESPP letter of 25th April 2022 and DG SANTE reply of 30th May 2022 online at www.phosphorusplatform.eu/regulatory

Research

'Our Phosphorus Future' report published 9th June

This project has engaged over 80 scientists and experts worldwide to develop a global report on P sustainability challenges, and aims to provide the evidence base for global action. Our Phosphorus Future was supported by the United Nations Environment Fund (UNEP) and ESPP. A call for a global science initiative on phosphorus was launched at the 3rd European Sustainable Phosphorus Conference (ESPC3, Helsinki, 2018) with over 500 signatories. Chapters of the Our Phosphorus Future report address phosphate resources and uses, food and agriculture systems and consumption, water quality, recycling and recovering. The report's thematic chapters have been circulated for review to the 80+ chapter authors and to further stakeholders and experts including the UNEP GPNM (Global Panel for Nutrient Management), members of ESPP and members of the Sustainable Phosphorus Alliance North America. Over 80 pages of comments were received, reviewed by CEH, and then proposed changes validated by each chapter's authors and, where useful, with consultation of other experts. An overview of the questions addressed in the 'Our Phosphorus Future' (OPF) report was already published in Nature Food, February 2021, see below. The conclusions of Our Phosphorus Future will be presented and discussed at ESPC4 Vienna 20-22 June 2022.

ESPP has contributed financially to the 'Our Phosphorus Future' project (OPF): the report is independent and represents the views of the authors, not of ESPP. Future Our Phosphorus Future website after launch on 9th June 2022 www.opfglobal.com

Overview of global P sustainability questions

A short article in Nature Food outlines key global issues of phosphorus sustainability, covering agriculture, water quality, food production and consumption, waste management, recycling, phosphate rock resources. The 3 page overview underlines that despite the known environmental challenges around phosphorus (planetary boundaries, eutrophication and harmful algal blooms), which are likely to be accentuated by climate change, phosphorus remains still largely absent from global intergovernmental agendas. Some targets are however now being considered, for example the United Nations Convention on Biological Diversity (CBD) Post-2020 Global Biodiversity Framework working group proposed the target to reduce pollution from excess nutrients by 50% by 2030. This is now taken up by the EU Green Deal (Farm-to-Fork and Biodiversity strategies) which fix the target of reducing nutrient losses by 50% by 2030 (see SCOPE Newsletter n°139). The UN Framework for Freshwater Ecosystem Management (2018, vol. 4) provides information to support countries in setting freshwater phosphorus standards. The Nature Food article underlines that issues are highly region-specific: in Africa, current trends of insufficient phosphorus fertiliser use could lead to 30% crop yield losses by 2050, whereas in other regions "excess fertiliser application is threatening water quality". Actions to address these challenges are indicated, including reducing consumption of animal products in diets, phosphorus recycling (noting the need for regulatory and economic policy to support this), optimising livestock diet phosphorus and its uptake (e.g. phytase), addressing "legacy phosphorus" in soils and sediments, improving phosphorus efficiency of crops, better fertiliser distribution in poorer countries, public awareness and phosphorus footprinting, as well as actions to reduce impacts of algal blooms.

"Global actions for a sustainable phosphorus future", W. Brownlie et al., Nature Food, vol. 2, Feb. 2021, 71-74 DOI.

Nitrogen Use Efficiency for European farms varies from 17% to 75%

Study of 1 240 farms of different types across Europe shows mean NUE (Nitrogen Use Efficiency) adjusted for externalisations from <20 % for dairy to > 60% for arable, with top quartile of arable achieving 75% NUE. Externalisation takes into account N used in production of imported animal feed and N losses related to exported manure. These levels of NUE correspond to a mean N "emission intensity" of around 3, ranging from below 1 to 8 for dairy farms (calculated as N surplus / N output). Arable farms mostly show N emission intensity 0.5 – 1.5, but with a few farms up to 8. This corresponds to median N surpluses of around 70 kgN/ha for arable and 155 kgN/ha for dairy farms. Pig farms are considerably more N efficient than dairy, but still around twice as inefficient as arable. The authors suggest "modest targets" for NUE of 19% for dairy, 23% for pig farms, and 61% for arable, these being the current median. This would (by definition) imply improvement for half of existing farms, but ESPP suggests it is highly unambitious and that a more appropriate target would be the Q1 (lowest 25% of farms), which is not significantly lower for livestock but is 25% lower for arable (17%, 21%, 45%).

"Exploring nitrogen indicators of farm performance among farm types across several European case studies", M. Quemeda et al., Agricultural Systems, vol. 177, Jan. 2020, 102689 DOI.



Data shows no significant impacts of phosphorus intake on health

Analysis of US national data shows no meaningful associations between phosphorus intake and mortality and limited correlations with cholesterol, kidney markers or (lower) blood pressure. US NHANES (National Health and Nutrition Examination Survey data were analysed from the 1988-1994 through to 2001-2006 surveys. This survey includes test data on relevant biomarkers, such as blood levels of phosphorus, kidney-function markers, cholesterol and blood pressure, mortality and cardio-vascular disease data, and also a diet questionnaire. Natural and additive (food additive) phosphorus intakes were estimated from the diet questionnaire result using a commercial market database of food ingredients. Variables such as age, exercise were statistically compensated. Data from 12 000 to 36 000 participants was analysed depending of data availability for different factors. Total diet phosphorus increased from 1.3 to 1.4 gP/person per day over the period, despite a decrease in food additive phosphorus (from 0.18 to 0.16 gP/person/day). Total diet P was associated with increased blood phosphorus, but "No meaningful associations" between total diet phosphorus and mortality were found. Added phosphates were associated with small increases in creatinine (a kidney-function marker protein) and small decreases in HDL-cholesterol (of which reduced levels are a negative health indicator). Total diet phosphorus was inversely correlated to reduced blood pressure and slightly to total blood cholesterol. The authors suggest that phosphorus may reduce blood pressure by increasing parathyroid hormone levels. The authors note that natural phosphorus in food and phosphorus in food additives appear to have disparate health effects and recommend that better information is needed on phosphorus food additive levels in diet, further research is needed to better understand possible differing health impacts of natural and added phosphates, and that regulators should consider defining different dietary specifications for natural and for food additive phosphorus in diets.

"Association of Total, Added, and Natural Phosphorus Intakes with Biomarkers of Health Status and Mortality in Healthy Adults in the United States", K. Fulgoni et al., Nutrients 2022, 14, 1738 <u>HERE</u>.

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ESPP members

