European Sustainable Phosphorus Platform — IFOAM EU GROUP — MAKING EUROPE MORE ORGANIC

Organic farming: closing nutrient cycles and uptake of recycled fertilisers

Potential and challenges uptake of recycled nutrient and recycled organic carbon products as a route to close cycles in organic farming. In collaboration with IFOAM – EU group organic agriculture

Brussels Tuesday 12th December, 9h30-17h + networking drinks 17h-18h

Registration www.eventbrite.ca/e/recycled-nutrients-and-organic-food-tickets-38702699817?aff=es2

Industry joint statement

EU Fertilisers Regulation

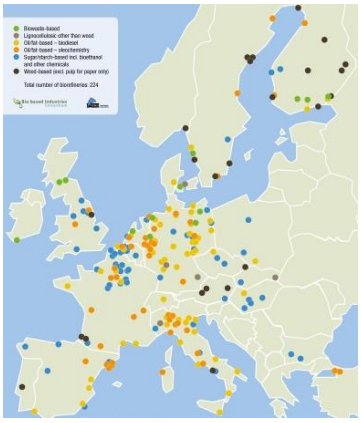
For the first time ever, a Joint Statement (14 organisations) has been established and signed by key industry federations and stakeholders concerned by the full range of soil improving products, growing media, organic and mineral fertilisers, biostimulants and nutrient recycling. This initiative is co-lead by ESPP (European Sustainable Phosphorus Platform). The Joint Statement underlines that the EU Fertilisers

Regulation is strongly awaited by industry and stakeholders to develop the circular economy, and indicates nineteen issues which need to be resolved in the finalisation of the text in "trialogue" (European Parliament, Council and Commission) over the coming months. This follows the vote of the Parliament's position 24/10/2017 with adoption of the Council position expected soon. The Joint Statement aims to positively contribute to finalisation of the Fertilisers Regulation, to improve dialogue and to "*achieve a final regulatory text which is workable in implementation, which will facilitate innovation and development of the nutrient circular economy and nutrient stewardship, whilst ensuring the protection of farmers, consumers and the environment*."

Cross-industry and stakeholder Joint Position
www.phosphorusplatform.eu/images/download/Joint-statement-industry-Fert-Regs-finalised-20_11_17.pdf%20
European Parliament plenary voted report (amendments submitted to trialogue)
www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P8-TA-2017-0392
Initial Commission proposed Regulation text http://ec.europa.eu/DocsRoom/documents/15949

Policy

Biorefineries at EU Bioeconomy Policy Day



Europe's key biorefine players met within the EU Bioeconomy Policy Day (see below). Leading biorefine companies (**Booregaard Norway**, **Clariant**, **UPM Biofore**) presented operating plants in the 50+ kt/y scale, showing a range of different models: forest by-product input or crop by-products, economics driven by biofuels or by chemical products refining. Discussions underlined the challenge of adjusting the current bioenergy subsidy/obligation policy to enable continuing development of biofuels from by-products, whilst not artificially competing out biorefining of added-value chemicals which valorise chemical functionalities of natural molecules. The Bio-Based Industries Consortium (BBI) presented a map now online showing nearly 200 full-scale biorefineries operating today across Europe (see www.bio-based.eu/graphics). The workshop proposed recommendations to the EU's BioEconomy Strategy, including clarifying sustainability criteria for biofuels based on the cascading use principle (material reuse and recovery of chemicals as priority, preferable to biofuels or energy production).

Information about biorefineries www.bio-based.eu

EU public consultation on pharmaceuticals

The European Commission has opened a public consultation on the risks from pharmaceuticals in the environment (**open to 21st February 2017**). This follows a consultation on the "pharmaceuticals roadmap" in Spring 2017. ESPP responded underlining the need for more information to ensure safety and develop public confidence in recycling of organic products (composts, digestates, etc.) from manures and sewage biosolids. The current consultation is based on a 25 page document, which assesses 30 possible public policy options based on a scientific research review and stakeholder consultation. These include developing knowledge - data and risk assessments, "greener" pharmaceutical design, rationalising pharmaceutical use, pharmaceutical waste collection and "more effective management of waste water, manure and sludge". Here, options noted include wastewater treatment in hospitals, water treatment and "better source control through better handling of manure, sewage sludge, and water reused for irrigation". The consultation asks several short questions about awareness of pharmaceuticals in the environment, and possible priority actions to address risks, then enables submission of comments on possible actions, information sources and actions underway, and is open to public response.

ESPP input to consultation www.phosphorusplatform.eu/images/download/ESPP-response-pharmaceuticals-roadmap-submitted-12-5-17.pdf
EU public consultation on "pharmaceuticals in the environment", open to individuals and organisations to 21st February 2018
https://ec.europa.eu/info/consultations/public-consultation-pharmaceuticals-environment_en
Background document https://ec.europa.eu/info/sites/info/files/background_document_public_consultation_pharmaceuticals_environment.pdf
ESPP – European Environment Bureau – and industry joint position on the need for research into organic contaminants in manures and sewage biosolids recycling www.phosphorusplatform.eu/organic-contaminants

Recycling nutrients to animal feeds

EFFPA
EUROPEAN FORMER FOODSTUFF PROCESSORS ASSOCIATION

An important presentation by **Paul Feathersone, EFFPA (European Former Foodstuff Processors Association)** at the EU Bioeconomy Policy Day (see below) underlined the important current role and potential of return of food industry by-products and appropriate streams of food waste to animal feeds. He underlined that safety is paramount, and that the first objective is reduction of food waste or social reuse (food banks), not reprocessing. For unavoidable food waste, use as animal feed is much more energy and nutrient efficient than conversion to fertiliser/soil improver, especially for valorisation of proteins. Current challenges include failure of the EU to move forward on authorisation of insect products as animal feeds (see e.g. Agriprotein, black soldier fly larvae recycling of food waste

in ESPP eNews n°15) and exclusion from recycling of products containing traces of ABPs (animal by products), such as foods with meat flavouring additives. EFFPA thus provided a valuable reminder that recycling to animal feeds should not be forgotten in the current context of the high interest around the new EU Fertilisers Regulation. The EFFPA presentation showed that the sector has the same problems with DG SANTE as are apparent with the Fertilisers Regulation: absence of response, failure to move forward on the Circular Economy

EFFPA - European Former Foodstuff Processors Association www.effpa.eu

European Commission Bioeconomy Policy Day

The Bioeconomy Day, 16th November, Brussels, was co-organised by nine different European Commission Directorates: Research, Growth, Agriculture, Climate & Energy, Regions, Environment, JRC, Oceans, Santé, with input from the Commissioners for Research and Agriculture and from MEP Simona Bonafé, rapporteur for the Waste Framework Directive revision. Joanna Dupont-Inglis, European Association for Bioindustries, presented the Bioeconomy Stakeholders Manifesto, just published. This refers to the need to "improve food, nutrition and water security". She noted that this detailed position obtained consensus of nearly all the participant stakeholders, but that a small number finally did not sign because of divergences over the inclusion in the document of the need for reform of the EU Common Agricultural Policy (CAP) and the principle that there are limits to biomass production. Chris Thornton, European Sustainable Phosphorus Platform (ESPP), presented on developing the nutrient Circular Economy, explained the need for regulatory support (in particular the EU Fertilisers Regulation, standards, nutrient discharge regulation …) but also the need to go beyond this and address the market and economics: public procurement policies, enabling farmers to transfer sustainability costs to supermarkets and consumers, transfer of the fiscal burden from employment to energy and resource consumption. The Day's main conclusions were needs for: a clear and stable policy framework, for policy coherence across different European Commission services, for support both for innovation and for scale-up to market, for monitoring and indicators, and for new business models and supply chains.

European Commission Bioeconomy Policy Day, 16 November 2017 https://ec.europa.eu/programmes/horizon2020/en/news/bioeconomy-policy-day ESPP presentation video https://webcast.ec.europa.eu/info-day-horizon-2020-societal-challenge-2-calls-for-proposals-2018-11-16-jenk

EU water policy re-evaluation

ESPP has submitted positions to the two recent EU public consultations on water policy: evaluation of the Urban Waste Water Treatment Directive (WWTD) and of the Water Framework Directive (WFD). ESPP underlined the importance of these two regulations in improving EU water quality, and the economic and social value this bring. ESPP underlined the need to extend these policies to better take into account nutrient stewardship and recycling, return of organic carbon to soil, biodiversity. ESPP notes the economic challenges of implementing water treatment and reducing agricultural nutrient losses, in particular cost recovery (as is required by the Water Framework Directive) and the need for innovative economic tools such as catchment permitting or nutrient emissions trading.

ESPP input to Urban Waste Water Treatment Directive and to the Water Framework Directive consultations www.phosphorusplatform.eu/regulatory

Food and beverage industry

Nutrients, the foundation of food sustainability

ESPP presented at the Food & Drink Business Europe conference, Coventry UK, 7th October, on the challenges of nutrient stewardship in food production and phosphorus in diet. Other speakers at the conference included PepsiCo, WWF, Jackson Foods UK, Jordans-Ryvita, ADAS, NIS Nutritics, Véolia, BASF, Cargill … Chris Thornton, for ESPP, reminded that nutrient input is essential for food production: we could feed maybe one fifth of the world's current population without mineral fertilsers. Yet, in Europe, we consume around twice as much phosphorus in our diet as we need as a nutrient (in meat, vegetables, and maybe 5-10% as phosphate food additives). These increased levels of diet phosphorus raise questions about their possible health impact, with a need for more scientific research. Elevated blood phosphorus levels seem to be correlated to cardiovascular disease risk (CVD), but available evidence does not suggest that diet phosphorus is linked to blood phosphorus, which is regulated by the kidneys in healthy individuals. Better information about food phosphorus is however critical for kidney disease patients (CKD), that is c. 30 million people in Europe*.

** Based on Ketteler, in SCOPE Newsletter n°125: 7% of the population.*
ESPP presentation "Nutrients: the foundation of food sustainability" www.slideshare.net/NutrientPlatform/nutrients-the-foundation-of-food-sustainability-sustainable-food-beverage-conference-coventry-7-november-2017

True cost of food is twice what we pay

A new report by the Sustainable Food Trust shows that the real cost of food in the UK is twice what consumers pay in shops, because of hidden costs (externalities). For UK£1 paid for food, environmental damage costs an additional 50 pence, that is costs which are born by society either today or our children: pollution, climate change, soil degradation, biodiversity loss. Health

care costs (born by taxpayers in national health systems, in fact principally by taxation on jobs) costs a further 37p. One of the biggest negative externalities for which a cost estimate is today available is the use of nitrogen fertilisers (see page 29 of the report). A further 10.5 pence goes to administrative, research, regulatory costs and for food imports. And just 2.5 pence is farm subsidies. Listen on BBC Farming Today replay.

"The hidden cost of UK food", Sustainable Food Trust, November 2017 www.sustainablefoodtrust.org/articles/hidden-cost-uk-food and www.sustainablefoodtrust.org/wp-content/uploads/2013/04/HCOF-Report-online-version.pdf BBC Farming Today 22 November 2017 – Patrick Holden, Sustainable Food Trust (8'25") and reaction of Duncan Pollard, Nestlé (10'55") www.bbc.co.uk/programmes/b09fj9jh#play

Fertiliser value of recovered fertilisers

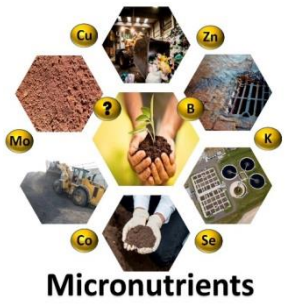
Struvite fertiliser availability and soil magnesium

Struvite fertiliser availability varies significantly as a function of soil magnesium, according to a study on struvite recovered from urine for fertiliser availability in three South African soils. The study uses phosphorus adsorption equilibrium, soil incubation and six week maize pot trials. The three soils were Inanda, Sepane and Cartef types with phosphorus equilibrium contents of 1.39, 0.17, 0.13 mgP/l, buffer coefficients of 454, 71 and 50 mg.kg/mg.l and pH 4.8, 6.9 and 6.8. Struvite was applied at 0.5, 1 and 2 times recommended application rates, which were 20, 60 and 80 kgP/ha for the different soils, plus a control (no fertiliser) and single super phosphate (SSP, at recommended application rate). Maize responded better to struvite than to SSP on the Cartef soil, but better to SSP on the Sepane soil (even when struvite was applied at twice recommended application rate), and showed no response to either fertiliser on the Inanda soil. The Sepane soil has ten time higher exchangeable magnesium than Cartef soil (Sepane = 8.6 $cmol_c$/kg) so it is logical that struvite phosphorus is poorly available in this soil, because the magnesium will impact the solubility product.

"Possible use of struvite as an alternative phosphate fertilizer", N. Nongqwenga et al., J. Soil Sci. Plant Nutr. vol.17 no.3 Temuco set. 2017 http://dx.doi.org/10.4067/S0718-95162017000300003

Nutrient recycling potential data

Potential for recovery of other nutrients



A report for the Netherlands Government assesses possibilities for recovery of nutrients (other than phosphorus and nitrogen) from waste streams. Based on criticality of mineral resources and importance for agriculture, priorities are identified as: boron, cobalt, copper, potassium, molybdenum, selenium and zinc. Waste streams considered include sewage, industrial wastes, municipal solid waste, animal by products, coal ashes and other ashes. The report recommends further research into agricultural use of sewage biosolids (after e.g. composting) but notes the need to address possible risks of organic contaminants. The following recovery routes are identified as having potential: bioleaching and phytoremediation (plant uptake of metals), polymer assisted ultrafiltration (PAUF), fly ash wasting / metal separation (FLUWA) and the Ecophos process (recovery of other nutrients in the residue after phosphorus recovery). Particular potential is noted for zinc and potassium from sewage sludge, Ecophos residues and municipal waste incineration bottom and fly ash (MWIP); copper from MWIP; boron, cobalt and selenium from coal ashes.

"Possibilities and opportunities for recovery of nutrients other than phosphorus. An exploratory research", by Tauw for the Netherlands Ministry for Infrastructure and the Environment, 29 September 2017, project n° 1244882 www.nutrientplatform.org/wp-content/uploads/2017/10/Possibilities-and-opportunities-for-recovery-of-nutrients-other-than-phosphorus-R001-1244882KJU-wga-V01-NL.pdf

Scotland's biorefining potential

A report to support the Biorefinery Roadmap for Scotland (2015, Scottish Enterprise) identifies 27 million tonnes/year of organic waste and by-product flows which could be better valorised. In particular, sewage biosolids, food waste, animal waste, agri-food industry by-products (distilleries 3 Mt/y, cheese making 0.5 Mt/y), potato and carrot processing, forestry, bakery wastes, and coffee grounds. To valorise these resources, actions considered necessary include better data on flows to identify geographical opportunities for biorefineries, better quality information on food waste and animal waste streams, increasing use of organic fertilisers, addressing regulatory barriers (e.g. to use of organic fertilisers), explore synergies between energy and biorefineries, investment in technologies to address logistics (de-watering, bioresource stabilisation for storage, transport). It is noted that phosphorus can be recovered in proteins for animal feed (e.g. via insect larvae), through technical recovery routes, or through organic fertiliser materials.

"Biorefining potential for Scotland. Mapping bioresource arisings across Scotland", Ricardo Energy & Environment for Zero Waste Scotland, September 2017 www.zerowastescotland.org.uk/sites/default/files/Biorefining%20Potential%20for%20Scotland%20Final%20report.pdf

Rendering industry fact sheet on phosphorus recycling

EFPRA, the European animal by-product processing industry federation, has published a fact sheet on the need to recycle phosphorus and the advantages of recycled phosphorus products recovered from slaughterhouse by-products. EFPRA estimates that among their members the rendering and slaughterhouse by-products processing industries in Europe recycle around 95 000 – 130 000 tonnes of phosphorus annually to livestock feed, pet food and fertilisers. This is estimated to represent 75% of the supply in the whole sector. In particular, food-grade bones from slaughterhouses are processed to produce gelatine (for the food and pharmaceutical industries) and to recover phosphorus as DCP (di calcium phosphate). Another recovered phosphorus product is de-limed bone meal (hydroxyapatite – tri calcium phosphate TCP).These recovered phosphorus products offer low contaminant levels, good phosphorus availability for livestock or plants, and safety and traceability from origin.

EFPRA European Fat Processors and Renderers Association) "The facts about phosphorus"
www.efpra.eu/wp-content/uploads/2016/11/The-Facts-About-Phosphorus.pdf
See also "Understanding Animal by-products and phosphorus recycling" in SCOPE Newsletter n°122

Meetings

Phosphorus and nitrogen footprints at JRC workshop

The European Commission Joint Research Centre (JRC) organized a Footprint Family workshop, 14-16 November 2017, Ispra (Italy), bringing together specialists from JRC and 11 invited international external experts on footprints. Footprints covered were the ecological, carbon, land, water, nitrogen, phosphorus, energy, material and biodiversity footprints. ESPP joined as expert and brought in knowledge and ideas from the phosphorus footprint perspective. The workshop aimed at creating an internationally recognized scientific panel to discuss synergies and conceptual differences between the different footprints and methods/data used, and to set the basis for footprints related to food production and consumption in the EU. Footprints are analysis and communication tools to assess the impact is of a person, product, company, sector, country in terms of resource use (depletion) and environmental pressure (pollution). The experts concluded that a combination of footprints (footprint family) would provide additional value for researchers, consumers and policymakers to work on sustainable production, consumption and waste management, with a clear link to environmental EU directives and the new UN Sustainable Development Goals. Furthermore it became clear that whereas for example the ecological, land, carbon and water footprint are well developed, for phosphorus and nitrogen there is a strong need for further development, in particular to take into account the virtual phosphorus consumption by imported products. Input on phosphorus and nitrogen footprints and their further development can be sent to kimovandijk@phosphorusplatform.eu

Outcomes of the finished EU research project One Planet Economy Network (OPEN) that focussed on the challenges Footprint Family as well
www.oneplaneteconomynetwork.org
Running Our Phosphorus Future research project will cover the phosphorus footprint
http://gtr.rcuk.ac.uk/projects?ref=NE%2FP008798%2F1See nitrogen footprint work in the Our Nutrient World report, prepared by the Global Partnership on Nutrient Management (GPNM) in collaboration with the International Nitrogen Initiative
http://nora.nerc.ac.uk/500700/1/N500700BK.pdf
"Nitrogen footprints: past, present and future" Galloway et al. 2014, IOPScience http://iopscience.iop.org/article/10.1088/1748-9326/9/11/115003
Website Global Footprint Network www.footprintnetwork.org

First annual Critical Raw Material (CRM) event

The first Annual Critical Raw Material (CRM) Event, 7 November 2017, Brussels, was co-organised by the European Commission (EC), with the Horizon 2020 projects SCRREEN, CHROMIC, EQUINOX, INREP, PLATIRUS and SCALE. It took place in parallel to the Advanced Mining Countries Conference on Responsible Mining and Sourcing. EC DG GROW presented the outcomes of the Critical Raw Material Assessment 2017, to which ESPP input, and which led to now include white phosphorus (P4) additionally to phosphate rock on the EU List of Critical Raw Materials (see eNews 15). SCRREEN is hosting the EU CRM network gathering European initiatives, associations, clusters, and projects working on CRMs to contribute to Europe's CRM strategy in Europe. The Raw Materials Information System (RMIS) was presented by the EC Joint Research Centre (JRC), which is a structured repository of knowledge, data, methods, approaches and indicators on non-energy-related raw materials. Also presented was the SusCritMat project which aims to educate people from Master's student level up, both in industry and academia about important aspects of sustainable CRMs. The other projects presented focus on metals recovery including efficient mineral processing and hydrometallurgical recovery of by-product metals from low-grade metal containing secondary raw materials.

Programme Annual Critical Raw Material Event www.scrreen.eu/wp-content/uploads/2017/11/RMW_CRM-event-on-7-nov-2017_v20171106-final.pdf
SusCritMat Winter School, January 15-19, 2018 www.suscritmat.eu/winter-school
JRC Raw Materials Information System http://rmis.jrc.ec.europa.eu
SCRREEN project www.scrreen.eu

Resource Recovery, Just Do It?

The Dutch Water Network (KNW) organised a symposium, 9 November 2017, Wageningen Netherlands, on the recovering and recycling of resources from waste(water). This symposium brought together resource recovery projects, discussing drivers and barriers of economic viable pathways of recycling. ESPP gave a presentation about the opportunities and challenges for nutrient recovery from wastewater from an EU regulatory context. Other nutrient related presentations focussed on the potential future technologies to recover carbon, sulphur, nitrogen and phosphorus (WETSUS), and the recovery of sulphur from biogas applied as fertilizer in agriculture (Fertipaq by PAQUES), making mainly use of electrochemical and biochemical processes, and resulting in a product with agronomic properties better than petrochemical origin sulphur. Examples of pilot scale research into the recovery of the important micronutrients zinc and selenium were presented. One of the main conclusions was that technologies are available to recover many different resources, but that the recovery process is just a first step. Application of the recovered resource, and making a positive business case are two aspects that are at least as important. Necessary questions in setting up a viable business case were discussed, for example (1) in which form to supply the resource/nutrient to the market, (2) how to collect and transport, (3) who will be the customers; farmers; distributors, (4) Is a permit or end-of-waste status required for its application, (5) how to organize the business structure, and (6) how to integrate a new innovative activity in an existing company.

Seminar presentations and programme www.h2owaternetwerk.nl/over-knw/knw-evenementen/1256-resource-recovery-just-do-it

Research

Veolia Institute – Oxford Martin School

Ludwig Hermann, ESPP President and Outotec, spoke on phosphates at the 10th International Resource Availability Conference, Oxford, UK, in cooperation with Kazuyo Matsubae, Tohoku University, Japan. They highlighted the need to respond to resource challenges to ensure supply of phosphate for agriculture and food security, a non-substitutable input. They noted the low use efficiency and large waste flows containing phosphorus, and discussed commonalities and differences of policies and technical developments in Europe and Japan. The conference identified a shared concern, for different raw materials, about reduced mining productivity leading to cost increases. The long timespans from the decision of opening a new mine to actual production was underlined.

10th International Conference - Resource Availability in a Low Carbon World
www.institut.veolia.org/en/media/news/10th-international-conference-resource-availability-low-carbon-world

Life cycle analysis of phosphorus recycling routes

A life cycle analysis (LCA) study compares 17 different recycling routes, and with phosphate rock (applied directly to soil) and triple super phosphate mineral fertiliser. 11 of the 17 routes showed positive for most of the environmental impacts considered. In particular, anaerobic digestion/digestate show positive impacts (due to renewable methane energy production and conservation of nitrogen), as do direct application of sewage biosolids to agriculture, use of biomass ash and use of meat and bone meal ash. Application of sewage sludge incineration ash to land (which is not realistic in any case, because of contaminants and low phosphorus availability) shows less positive LCA results, because most of the energy recovered in incineration is consumed in necessary prior sludge drying. More complex phosphorus recovery processes studied (technical phosphate recovery from sludge or ashes) showed higher energy demand and greenhouse emissions than mineral phosphate fertilisers, but lower impact on resource consumption (phosphate reserves). The authors note that recycling of other elements (nitrogen, potassium) significantly impact the LCA results of different phosphorus recycling routes.

"Comparison of the environmental performance of different treatment scenarios for the main phosphorus recycling sources", S. Hörtenhuber et al., Renewable Agriculture and Food Systems, 2017 https://doi.org/10.1017/S1742170517000515

Priorities for research into organic phosphorus in agriculture

A paper by 90 scientists identifies seven priorities for research into organic phosphorus (P_{-org}) in soil and agriculture. The authors note a considerable increase in publications concerning P_{-org} from around 150 in 2000 to 400 in 2016. The paper is based on contributions of participants at a workshop on organic phosphorus in the UK in 2016 (www.op2016.com) so may not be a representative set of experts. A better understanding of organic phosphorus in considered important to enable a better use of organic recycled fertiliser materials, so contributing to food security and to limiting phosphorus pollution. P_{-org} can cover both organic molecules containing phosphorus, and inorganic phosphates bound to organic material. The research priorities identified are: methodologies, stoichiometry with other elements in organic matter, dynamics of P_{-org} in soils and land use systems, role of micro-organisms, interactions with nanoparticles (soil colloids, man-made), functional genes and metagenomics, measuring soil stocks – mineralisation, and cycling in soil, modelling, communication of research.

"Organic phosphorus key to future food security and sustainability", T. George et al., Plant and Soil https://doi.org/10.1007/s11104-017-3391-x

Questioning the global food system

An ambitious report from iPES FOOD (International Panel of Experts on Sustainable Food Systems) assesses the impacts of food and agriculture on human health, considering impacts of diets on health, environmental effects and occupational impacts on farmers and workers including livelihood stresses, as well as food insecurity. Unhealthy diets result in health costs (obesity, diabetes, heart disease, cancer …) of over 8 trillion US$/year. Added sugars, sodium, saturated fat, and trans fat, and a lack of fruit and vegetables, grains, and nuts and of micronutrients are cited. Environmental impacts include climate change and nutrient losses. Actions called for include promoting food systems thinking, independent science and integrated food policies involving all concerned stakeholders. Another report by WWF also criticises today's food system underlines the environmental impacts of meat production, both red and white meat, through land demand for animal feed crops. WWF also suggest that intensive livestock fed on energy- and protein-rich feed crops show higher unhealthy saturated fat content and lower omega-3 fatty acids in meat.

"Unravelling the food-health nexus" iPES-FOOD and Global Alliance for the Future of Food, 120 pages, 2017
www.ipes-food.org/images/Reports/Health_FullReport.pdf
WWF 2017 "Appetite for Destruction" www.wwf.org.uk/updates/appetite-for-destruction

Is nitrogen the next carbon?

A paper from the USA suggests that accumulation of fixed nitrogen in the environment poses planetary environment risks, as the biosphere's denitrification capacity could fail to keep pace. Anthropogenically fixed nitrogen (from mineral fertilisers and nitrogen-fixing crops) today accounts for around half of all fixed nitrogen annually, and is around five times higher than 60 years ago. Fixed nitrogen can lead to biodiversity loss (as natural species are competed out by species able to grow rapidly with high nitrogen levels), greenhouse emissions (especially nitrous oxide), eutrophication, nitrates in water supplies (accused of contributing to cancers and miscarriages) and ground-level ozone (harmful to human health and to vegetation). This is despite the increase in nitrogen use efficiency in agriculture over past decades: nitrogen fertiliser use has not increased since the 1990's whereas agricultural production continues to increase.

"Is nitrogen the next carbon?", W. Battye, V. Aneja , W. Schlesinger, Earth's Future, 5, 894–904, 2017 https://doi.org/10.1002/2017EF000592

Agenda

- ESPP General Assembly 11 December Brussels – members only
- **ESPP stakeholder meeting Recycled nutrients in organic farming, 12 December 2017, Brussels, Belgium** - Registration In collaboration with IFOAM, European stakeholder meeting on potentials and challenges for use of recycled nutrient products in organic farming
- Phosphates 2018 conference 12 - 14 March 2018**,** Marrakesh, Morocco - Website - the fertiliser, feed and industrial phosphates industries.
- **3rd European Sustainable Phosphorus Conference (ESPC3) 11 - 12 June 2018**, Helsinki, Finland
  More info will be published soon.
- Sustainable Food Summit, 14-15 June 2018 Website
- 6th Sustainable Phosphorus Summit (SPS2018) 20 - 22 August 2018, Brasilia, Brazil - Website

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