



science and policy
for a healthy future

 POLITIK

Regeringen vil forbyde farlige stoffer i bagepapir

Det skal være slut med at bruge fluorstoffer, der hjælper med at afvise smuds og vand, mener regeringen.



Fluorstoffer skal være
fortid i mademballage,
mener folkespørsmålsminister
Mogens Jensen (S).
(Foto: Niels Christian
Vilmann / Ritzau
Scanpix)

Fluorstoffer (PFAS) i forbrugerprodukter – hvorfor forbyde dem?

CEHOS informationsdag

30. oktober 2019

Xenia Trier (European Environment Agency)

Dette foredrag

- Hvad er fluorstoffer (PFAS)?
- Hvor kommer de fra?
- Sundhedsskader af fluorstoffer (PFAS)
- Analyser af PFAS i fødevareemballager (FKM)
- Dansk forbud mod fluorstoffer i fødevareemballage
- Hvad gør Danmark og EU?
- Hvordan kan man selv gøre for at mindske eksponering?

Hvad er fluorstoffer (PFAS)?

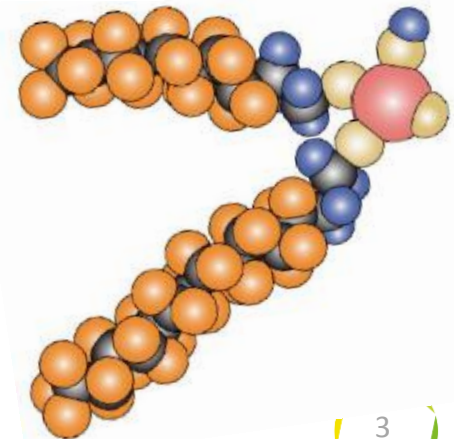
Fluorstoffer (per og polyfluorerede alkylstoffer, PFAS):
En gruppe af mere end 4700¹ syntetiske kemikalier

Bruges i bl.a. brandslukningsskum, fluorplastik (fx Teflon™, Goretex®), metal coatninger, fødevareemballage af papir og pap, cremer og kosmetik, tekstiler til møbler og udendørs tøj/gear, maling, trykfarver, forkrominger, i pesticider og medicin.

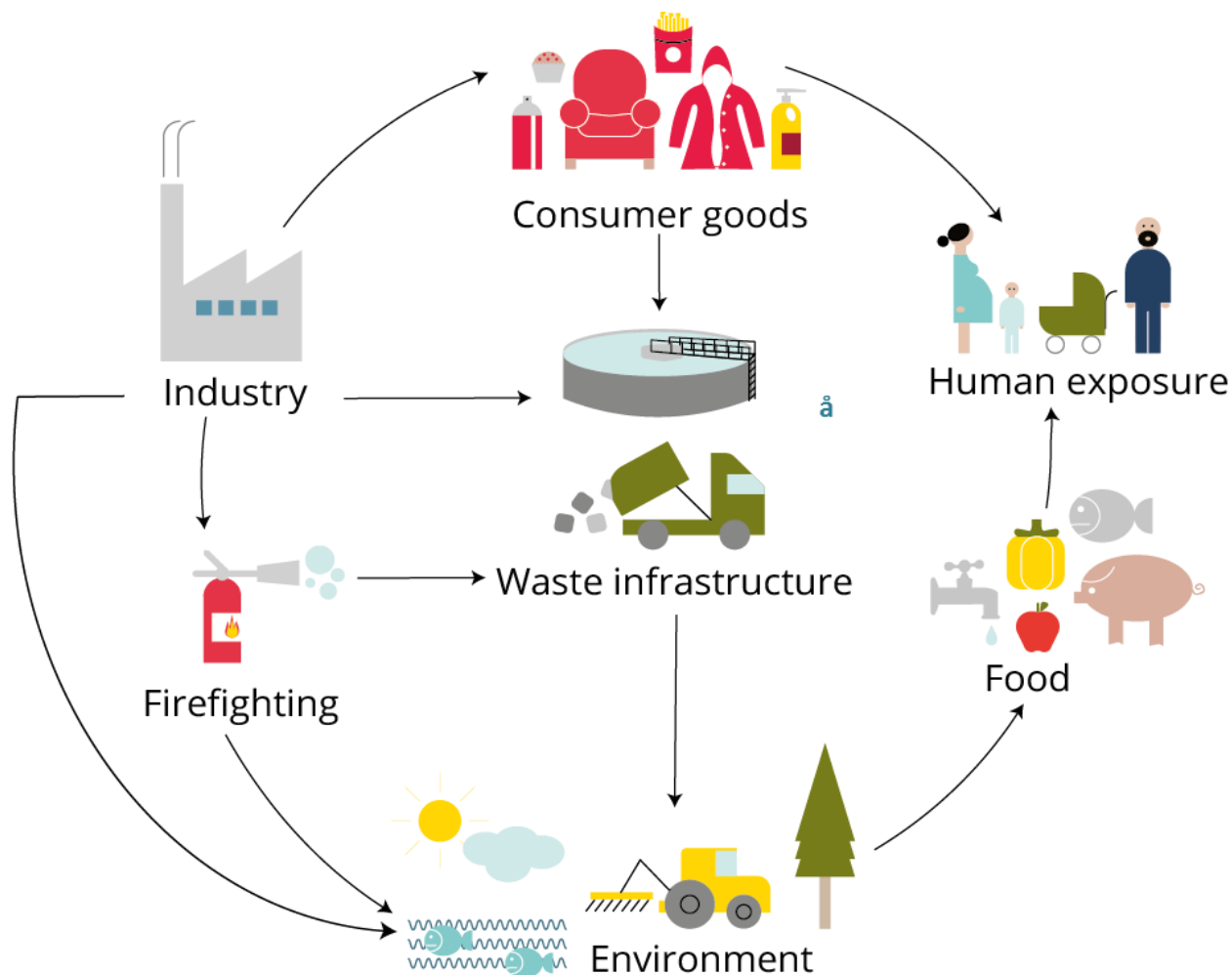


PFAS karakteristika

- Indeholder stabile, ureaktive fluorcarbon kæder
- Skyer derfor olie og vand, er temperatur og kemisk resistente og har overfladeaktive egenskaber
- Polyfluorerede PFAS nedbrydes til perfluorerede PFAS, som fx PFOA and PFOS
- Lang-kædede PFAS ophobes i mennesker, dyr, jord og sediment
- Kort-kædede PFAS er mobile => ophobes i vand og luft



Hvor kommer PFAS fra?



Væsentlige miljøkilder

- Forkroming
- Produktion
- (Rensningsanlæg)
- (Lossepladser)
- Lufthavne
- (Slam)

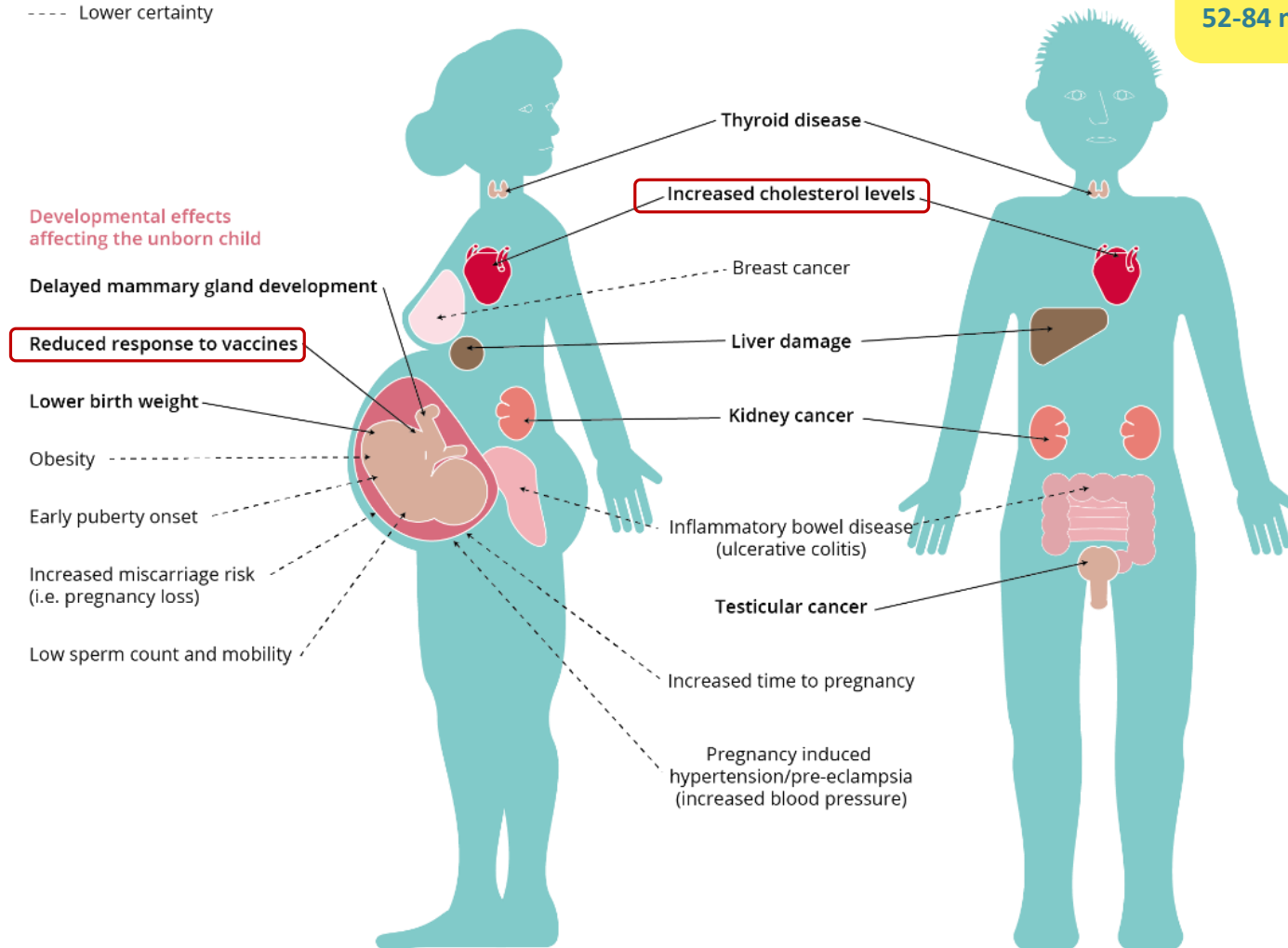
Væsentlige humane eksponeringsveje

- Fødevarer
 - Store rovfisk, skaldyr, FKM
- Vand
- Arbejdsmiljø
- Støv?
- Cremer/kosmetik?

Sundhedsskader af PFAS

Estimerede årlige
sundhedsmkostninger:
52-84 mia EUR/år i Europa¹

— High certainty
---- Lower certainty



Kilder: EEA, primarily based on the toxicological profile for perfluoroalkyls ([US ASTDR 2018](#)); the US Monograph on Immunotoxicity ([National Toxicology Program, 2016](#)), Cancer studies ([C8 Health Project Reports 2012](#), [IARC 2017](#), [Barry, 2013](#)), and developmental effects ([Fenton 2009](#), [White 2011](#)). The sources evaluated one or more of the substances: PFOA, PFNA, PFDeA, PFOS, PFHxS, PFOSA, Me-PFOSA-AcOH.

¹ Nordic council of ministers: Cost of inaction of PFAS. <http://norden.diva-portal.org/smash/get/diva2:1295959/FULLTEXT01.pdf>

Analyser af PFAS i FKM (DTU/KU)

June 2018: EFSA significantly lowering TWI for PFOA and PFOS => which methods are fit for compliance testing?

^{19}F NMR: 4 of 10 food paper had PFCs in them

PhD study:
UHPLC-ESI-QTOF method developed for >100 anionic and neutral PFAS in FCM: negative mass defects, homologue series, structural isomers

Total Organic Fluorine (TOF) in paper and board: all 25 suspect paper FCM samples (**100%**) have organofluorine
> LOD of $0.33 \mu\text{g F}^-/\text{dm}^2$ paper

On-line SPE-UHPLC-ESI-QTOF-MS on human serum intervention study
LODs 0.05 – 0.5 ng/mL

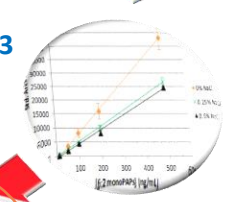
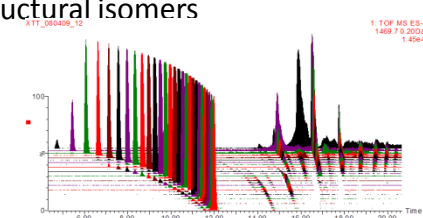
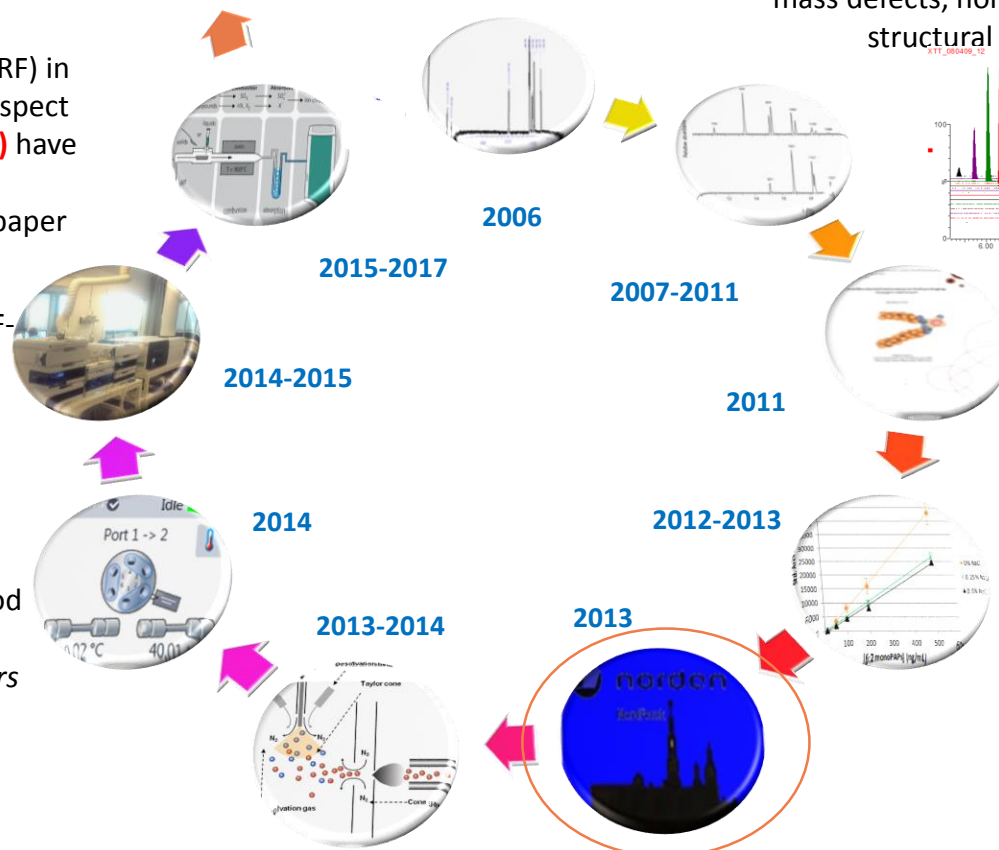
More sensitive paper method
29 PFAS excl. FTOH
MSc : **41%** of 27 FCM papers
 $0.02\text{--}74 \mu\text{g PFOA/kg}$
LOD ($0.05\text{--}0.5 \text{ ng/mL}$)
2nd media storm

National DK 'FDA' enforcement:
4% of 46 FCM papers without food > LOD ($0.1\text{--}1.7 \text{ ng/mL}$). 26 PFAS excl. FTOH Issues with verification SDL
New instrument cannot measure FTOHs

5th Int. PFAS – Nordfluor workshop in Helsingør, DK

PhD thesis :
PFCs in **61%** of 74 DK, CD, SK paper and board food packaging
Media storm

National DK 'FDA' survey :
PFAS in **45%** of 83 FCM papers
> $90 \mu\text{g PFOA eq./kg food}$
Food analysis (off line SPE)
 $0.2\text{--}28 \mu\text{g PFOA/kg food}$
23 PFAS incl. FTOHs,
LODs $1\text{--}8 \text{ ng/mL}$



PFAS forbud og mediedækning

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Det skal være slut med at bruge fluorstoffer, der hjælper med at afvise smuds og vand, mener regeringen.



Fluorstoffer skal være forbydt i mademballage, mener fødevareminister Mogens Jensen (S). (Foto: Niels Christian Vilmarin © Ritzau Scanpix)

01. SEP. 2019 KL. 23.58 | OPDATERET 02. SEP. 2019 KL. 09.26

[o] LES OP

Minister vil forbyde giftige fluorstoffer i mademballage

Popcorn, pomfritter og lagkagebunde skal ikke længere være pakket ind i emballage med giftige stoffer.



Fødevareminister Dan Jørgensen vil gå en gang og sørge for en dansk forbud mod fluorstoffer i emballage. Foto: DR Kontant © DR Kontant



Minister opfordrer MST:
Drikkevand skal sikres mod PFAS

=> nyt sum-kriterie for 9 PFAS (0.1 ng/L)



Contents lists available at ScienceDirect

Chemosphere

journal homepage: www.elsevier.com/locate/chemosphere

Chemosphere



Helsingør Statement on poly- and perfluorinated alkyl substances (PFASs)



Martin Scheringer^{a,*}, Xenia Trier^b, Ian T. Cousins^c, Pim de Voogt^d, Tony Fletcher^e, Zhanyun Wang^a, Thomas F. Webster^f

Perspectives | Brief Communication

The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)

<http://dx.doi.org/10.1289/ehp.1509934>



Udenlandske medie reaktioner

HEALTH TOXINS

These 9 Common Products May Contain a Potentially Dangerous Chemical

Sarah Begley @SCBegley | May 1, 2015



TIME

PFASs are in goods like pizza boxes and outdoor clothing

Health officials and advocates [called for](#) new research on the group of chemicals known as PFASs (or PFCs) on Friday, raising concerns that the substances could pose health risks.

These Chemicals in Pizza Boxes and Carpeting Last Forever

More than 200 scientists around the world document the threats of perfluorinated compounds and call for more government control.

By **Lindsey Konkel**, National Geographic

PUBLISHED MAY 01, 2015



 NATIONAL
GEOGRAPHIC

The Opinion Pages | OP-ED COLUMNIST

The New York Times

Chemicals in Your Popcorn?

JUNE 4, 2015



Nicholas Kristof

What do a pizza box, a polar bear and you have in common?

[All carry a kind of industrial toxicant](#) called poly- and perfluoroalkyl substances, or PFASs, that do two things: They make life convenient, and they also appear to increase the risk of cancer.

Massive Group Of modern farmer Scientists Thinks You Shouldn't Use Non-Stick

By **Dan Nosowitz** on May 19, 2015



A group of 200 scientists just published what's being called "The Madrid Statement," a wide-ranging criticism of the category of chemicals used to create non-stick, grease-proof and waterproof coatings. Will it get you to stop using non-stick pans?

Effekt af danske studier og kontrol

- **Vejledende grænseværdi i fødevareemballager af papir og pap**

Total fluor og specifikke analyser for PFAS

- Fald i niveauerne af PFAS der kan danne PFOA og lign. PFAS – men nye PFAS på vej
- Fald i hyppigheden af overskridelser
- Små niveauer bl.a. fra genbrugspapir og trykfarver
- Nye studier bekræfter tidl. studier at FKM en væsentlig kilde til PFAS i blod (i USA)

- **Studier af PFAS der påvirker børns udvikling** (fx. immunotoksicitet, hormonforstyrrende effekter mm) fra danske kohorter brugt til at fastlægge nye anbefalede grænseværdier af EUs fødevareresikkerhedsagentur (EFSA)

Research

A Section 508-conformant HTML version of this article is available at <https://doi.org/10.1289/EHP4092>.

Dietary Habits Related to Food Packaging and Population Exposure to PFASs

Herbert P. Susmann,^{1,2} Laurel A. Schaider,¹ Kathryn M. Rodgers,¹ and Ruthann A. Rudel¹

¹Silent Spring Institute, Newton, Massachusetts, USA

²Department of Biostatistics, University of Massachusetts Amherst, Amherst, Massachusetts, USA

BACKGROUND: Per- and polyfluoroalkyl substances (PFASs) are common industrial and consumer product chemicals with widespread human exposures that have been linked to adverse health effects. PFASs are commonly detected in foods and food-contact materials (FCMs), including fast food packaging and microwave popcorn bags.

OBJECTIVES: Our goal was to investigate associations between serum PFASs and consumption of restaurant food and popcorn in a representative sample of Americans.

METHODS: We analyzed 2003–2014 serum PFAS and dietary recall data from the National Health and Nutrition Examination Survey (NHANES). We used multivariable linear regressions to investigate relationships between consumption of fast food, restaurant food, fast food eaten at home, and microwave popcorn and serum levels of perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorodecanoic acid (PFDA), perfluorododecanoic acid (PFDDA), perfluorooctanesulfonic acid (PFOS), and perfluorodecane sulfonic acid (PFDS).

RESULTS: Calories of food eaten at home in the past 24 h had significant inverse associations with serum levels of a variety of PFASs, with stronger associations in women. Consumption of meals from fast food/pizza restaurants and other restaurants was associated with higher serum levels of PFOA, PFNA, PFDA, and PFOS, based on 24-h and 12-month recall, up to a 63% (95% CI: 30–95%) increase in those who ate popcorn daily over the last 12 months.

CONCLUSIONS: Associations between serum PFAS and popcorn consumption may be a consequence of PFAS migration from popcorn bags. Inverse associations between serum PFAS and food eaten at home—primarily from grocery stores—is consistent with home-prepared food and FCMs, some of which contain PFASs. The potential for FCMs to contribute to PFAS exposure and persistence, support the use of alternatives to PFASs in FCMs. <https://doi.org/10.1289/EHP4092>

Research

Plasma Concentrations of Perfluoroalkyl Substances and Risk of Type 2 Diabetes: A Prospective Investigation among U.S. Women

Qi Sun,^{1,2*} Geng Zong,^{1*} Damaskini Valvi,³ Flemming Nielsen,⁴ Brent Coull,^{3,5} and Philippe Grandjean^{3,4}

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A Section 508-conformant HTML version of this article is available at <https://doi.org/10.1289/EHP2619>.

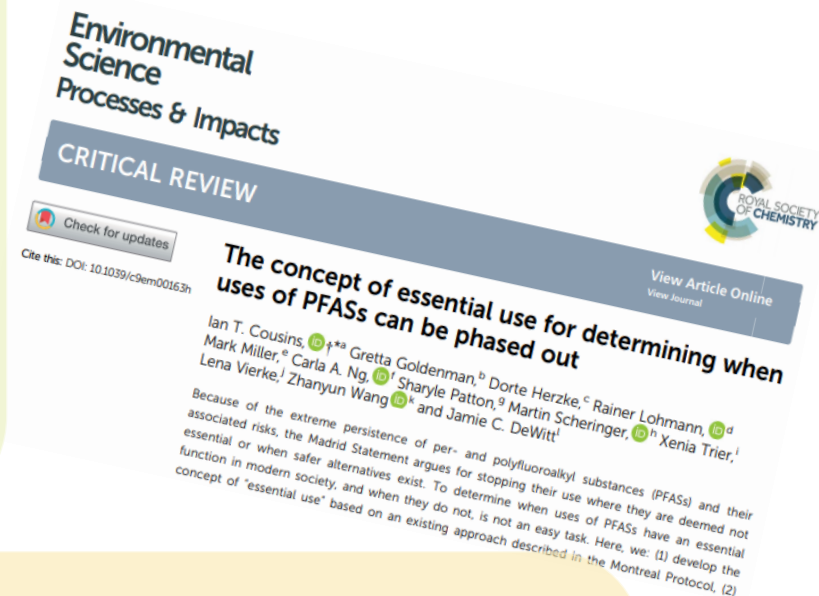
Hvad sker der i EU?

Countries:

- **Set single and group PFAS limits** in water, soil, products, food contact materials
- **National research** on exposure, hazard and innovation of (non-chemical) alternatives to PFAS
- Nordic council of ministers: **Costs of inaction of PFAS** (2019)
- **Council conclusion** (June 26th 2019): Call for action plan for PFAS to phase out (**societal**) non-essential uses of PFAS

EU

- **UN Stockholm convention on POPs**
- **ECHA/REACH** identification of PFAS as SVHCs (incl. persistent and mobile), authorisations and restrictions
- **EFSA** evaluations of PFOA, PFOS and mixtures
- **IPCHEM**: Access to data
- **EU research** projects on PFAS, e.g. **HBM4EU**
- **Revision of EU drinking water directive**: Groups of PFAS and 16 single substances
- **EU PFAS strategy** under preparation



HBM4EU: PFAS indikatorer i blod

HBM4EU: Human Biomonitoring for Europe

- Stort EU forskningsprojekt
- Samler forskningsresultater fra landene om kemikalier og effekter af dem i mennesker, og formidler til beslutningstagere
- PFAS er en af 18 grupper af kemikalier der bliver studeret



International Journal of
Environmental Research
and Public Health

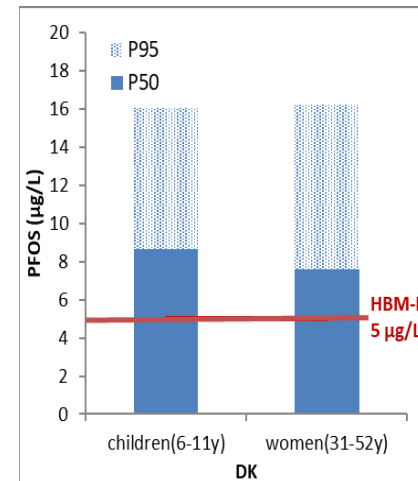
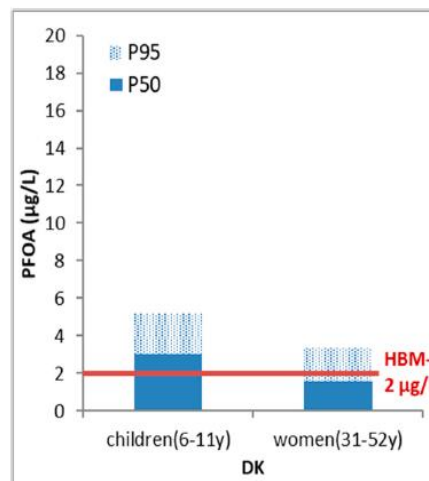
Article

Development of Policy Relevant Human Biomonitoring Indicators for Chemical Exposure in the European Population

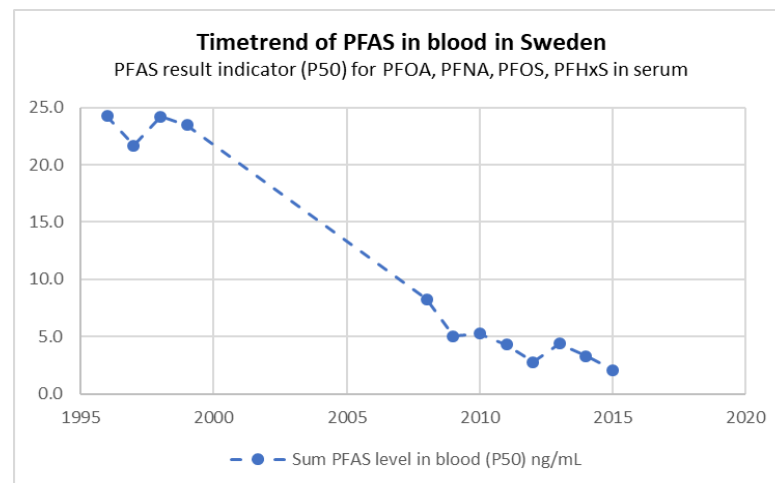
Jurgen Buekers ^{1*}, Madlen David ², Gudrun Koppen ¹, Jos Bessems ¹, Martin Schertinger ^{3,4}, Erik Lebret ⁵, Denis Sarigiannis ⁶, Marika Kolossa-Gehring ², Marika Berglund ⁷, Greet Schoeters ¹ and Xenia Trier ⁸



Post-policy indicator



Pre-policy mixture indicator



Hvad kan man selv gøre?

Reducere PFAS brug og eksponering ved at

- Købe PFAS-frie FKM, cremer/kosmetik og imprægneringsprodukter
- Bruge produkter fra miljømærker, som fx Svanen, EU Ecolabel og fra mærker og forhandlere som sælger PFAS-frie produkter
- Stille krav til udfasning af ikke-essentielle anvendelser af PFAS

Forbrugerrådet
Tænk

Test og forbrugerliv

Rådgivning og rettigheder

Aktiviteter og kampagner

Om os

Få testresultater, anbefalinger og hjælp til køb

Bliv medlem

Søg

<https://taenk.dk/search?query=fluorstoffer>



Flourerede stoffer



https://youtu.be/zkn-Yz_In78

Udenlandske medie reaktioner

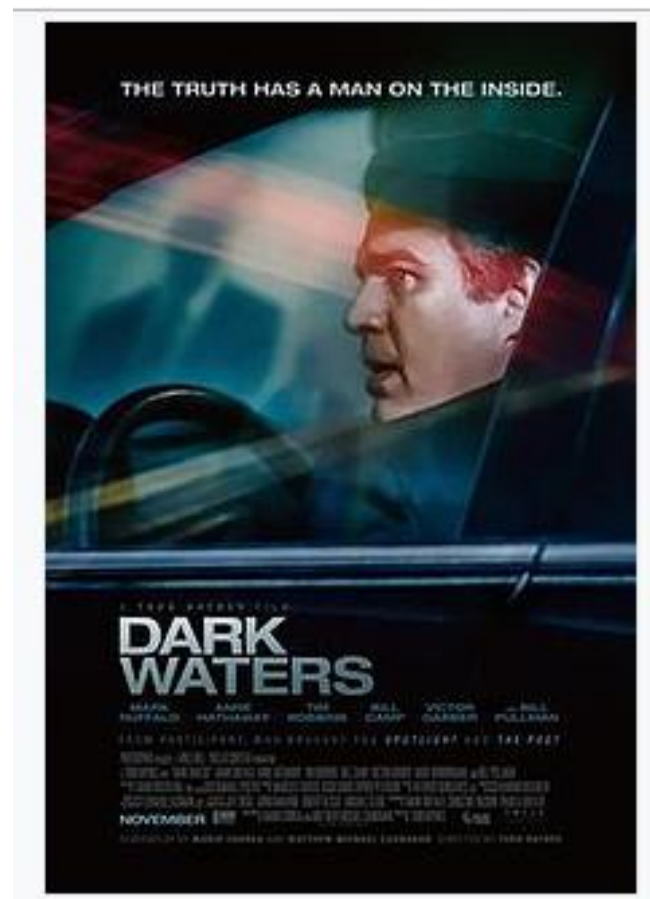


Rob Bilott on land owned by the Tennants near Parkersburg, W.Va. Bryan Schutmaat for The New York Times

FEATURE

The Lawyer Who Became DuPont's Worst Nightmare

Rob Bilott was a corporate defense attorney for eight years. Then he took on an environmental suit that would upend his entire career — and expose a brazen, decades-long history of chemical pollution.



**Premiere i USA:
22. november 2019**

Tak!

Spørgsmål?

HBM4EU and EEA colleagues

DTU: Kit Granby, Gitte Alsing Pedersen, Annie Foverskov, Anni Helleskov, Anna Kjerstine Rosenmai, Anne Marie Vinggaard m.fl.

FVST: Mette Holm, Charlotte Legind, Maja Kierkegaard

MST: Toke Winther

KU: Jan H Christensen, Lisbeth Knudsen, (RH) Anne Maria Andersson, Erik Skakkebæk, Katharina Main m.fl.

SDU: Philippe Grandjean, Tina K Jensen



Forbrugerrådet Tænk:
Claus Jørgensen, Stine Muller

Miljømærkning Danmark

COOP: Malene Teller Blume

Green Science Policy Institute

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