



# The second wave

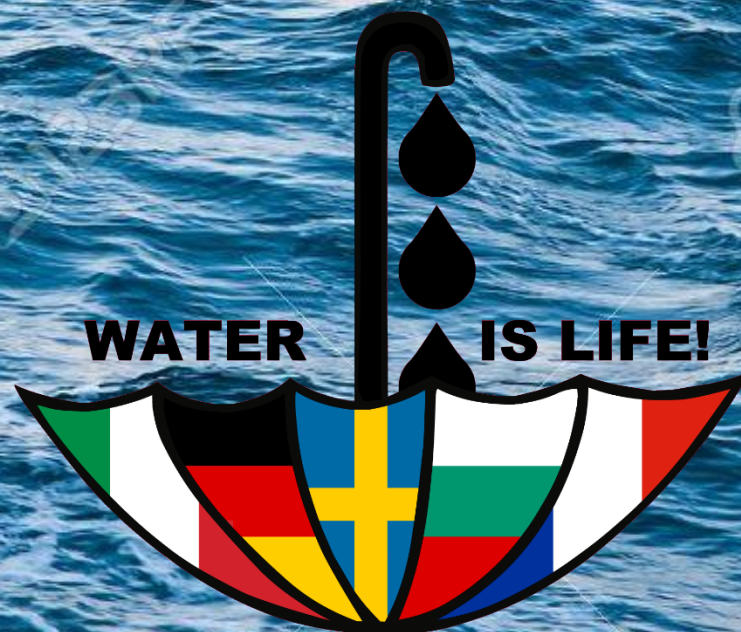
THE BALTIC SEA & environmental toxins

I.I.S.S. Bojano **ITALIAN TEAM**



# PFOA and PFOS

What do they do? How are they used? How do they affect us?





The Baltic Sea is a collection point for environmental toxins. The effects of the emissions are rarely known. But the devastating effects appear in both humans and wildlife:

- impaired fertility,
- impaired intellectual capacity
- impaired immune system.







Scientists are convinced that environmental toxins are one of the reasons that the situation for some species is getting worse. They want to learn more in order to better understand the interaction between people and nature.

Cecilia, an inhabitant of the archipelago, wants to know what environmental contaminants her newborn baby Alfred has swallowed. For the first time, researchers have the opportunity to analyze the infant's blood.



# ALFRED'S GENERATION



Alfred leaves a blood test. It turns out that he, a young child of a few months, has several chemical substances in his blood. They should not be there. Cecilia thinks a lot about what will happen to her children in the future.

Of every 20 children tested,



19 had blood contaminated with PFOA.



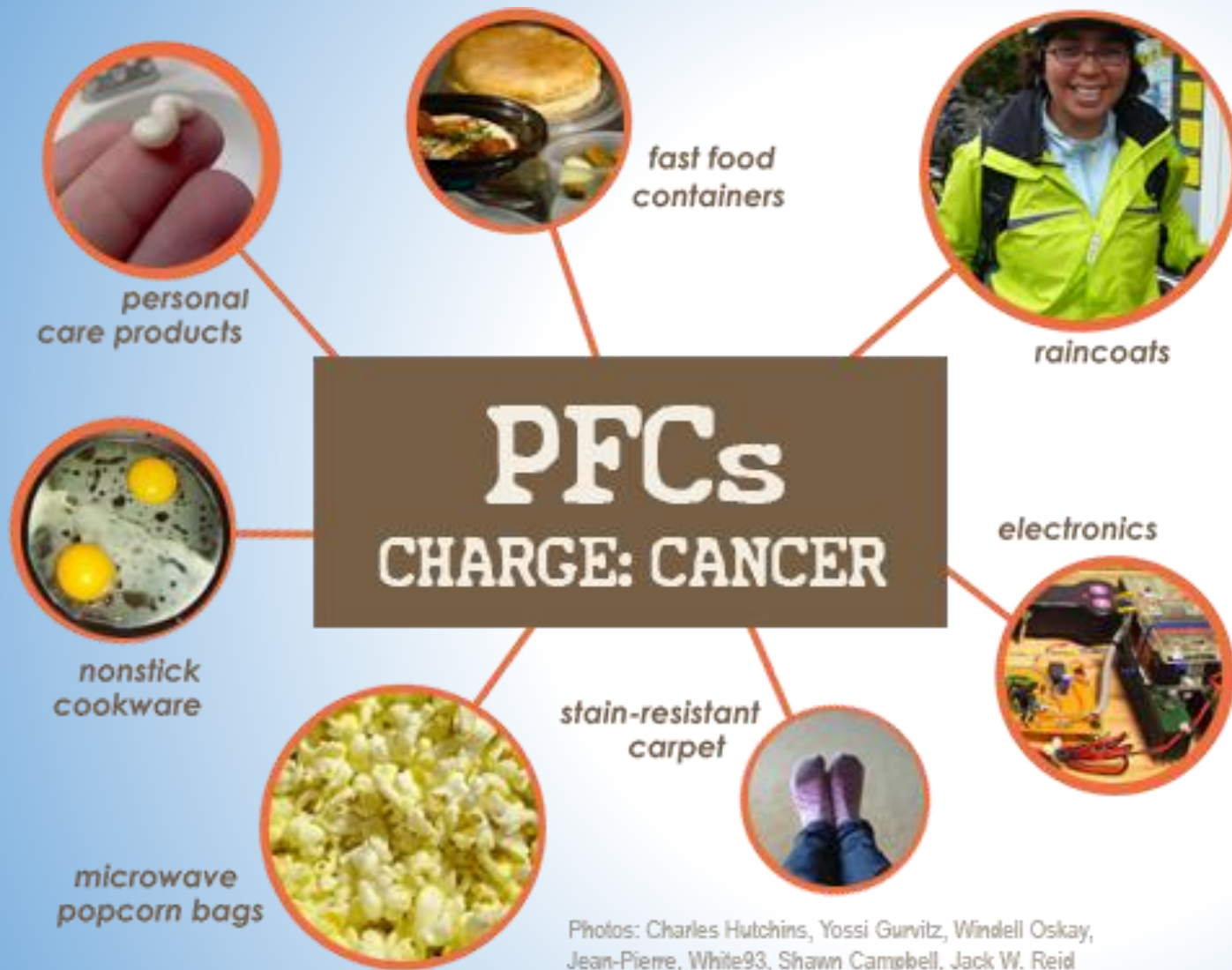
“According to the product register of the Swedish Chemicals Agency is about 20 tons of perfluorinated substances in chemical products in Sweden. But the amount shows only part of the truth.

**Perfluorinated substances** are used in low concentrations in many products and therefore they do not need to be notified to the product register.

Furthermore there is no information about the amount of perfluorinated substances that enter the country by products, which probably accounts for the highest amount of use in Sweden.”

( The Swedish Chemicals Agency is a central supervisory authority under the Ministry of the Environment and is responsible for “A Non-Toxic Environment)





**PFCs** are a class of chemicals used to repel oil and water from clothing, carpeting, furniture, food packaging, and non-stick surfaces on cookware and in fire-fighting foams. These likely human carcinogens are known to contaminate our products, food, and water.. There is widespread wildlife and human exposure to several PFCs, including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS)

PFCs being studied by NTP(national Toxicology Program)	
Name	acronym
Perfluorobutane sulfonate	PFBS
Perfluorohexane sulfonate	PFHxS
Perfluorononanoic acid	PFDA
Perfluorohexanoic acid	PFHxA
Perfluorooctanoic acid Perfluorooctane sulfonate	PFOA PFOS
Perfluorodecanoic acid Perfluorodecanoic acid	PFNA PFDA
8+2 Fluorotelomer alcohol	8:2 FTOH

A list of PCFs, among them PFOA and PFOS

The background of the slide is a photograph of an industrial facility, likely a refinery or chemical plant, with several tall smokestacks emitting thick plumes of white smoke. The sky is a mix of blue and orange, suggesting a sunset or sunrise. The foreground shows a body of water reflecting the scene.

# Perfluorooctane sulfonate (**PFOS**) Perfluorooctanoic acid (**PFOA**)

*The **PFOS** and the **PFOA**, two artificial chemical substances, are more and more frequently found in the food chain, due to environmental pollution, arising also from industrial activities. These chemical substances can accumulate in the human organism and they need many years before the organism is able to destroy them*



The **PFOA** is a chemical compound of synthetic and it is a very strong acid.



**PFOS** is general marketed as sodium salt. It is used mostly for materials like tissues and paper to make them resistant to oil and water.

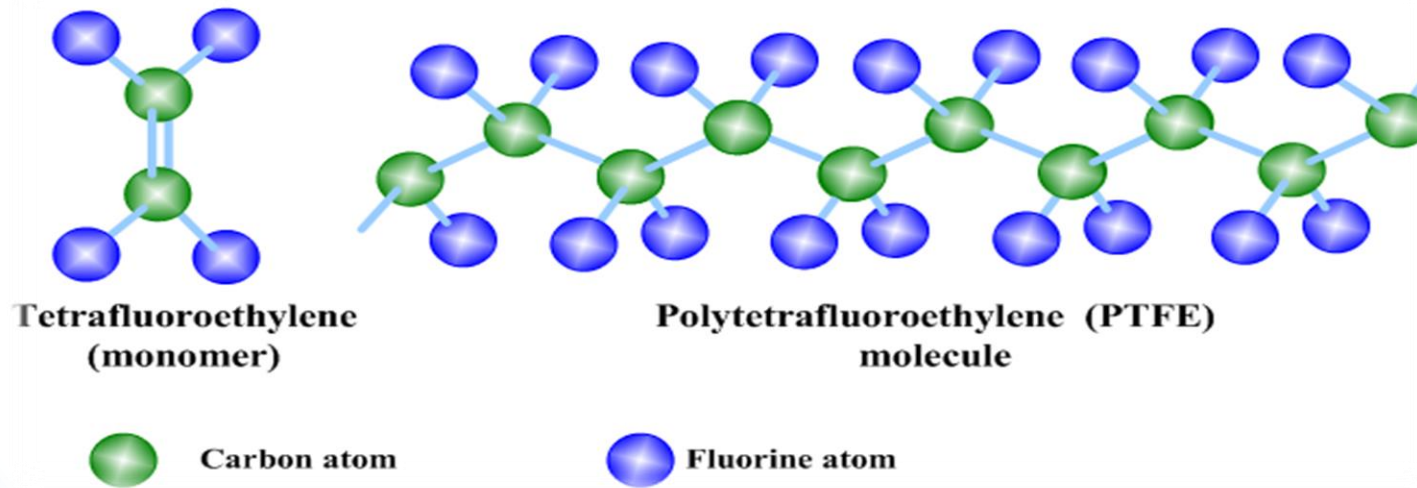
# PFOA

*The PFOA, also called C8 is used for the production of Teflon and as waterproofing, and it is toxic both for human body and for the animals. This is now demonstrated but it is not still known at what level.*



# Teflon (PTFE)

**Teflon** is a brand name for a man-made chemical known as polytetrafluoroethylene . It has been in commercial use since the 1940s. It has a wide variety of uses because it is extremely stable and can provide an almost frictionless surface.



## ***Some materials which are made by teflon***



# Do **PTFE** and **PFOA** cause cancer?

## Teflon (**PTFE**)

Teflon itself is not suspected of causing cancer because the PFOA is burned off during the process and is not present in significant amounts in the final products.



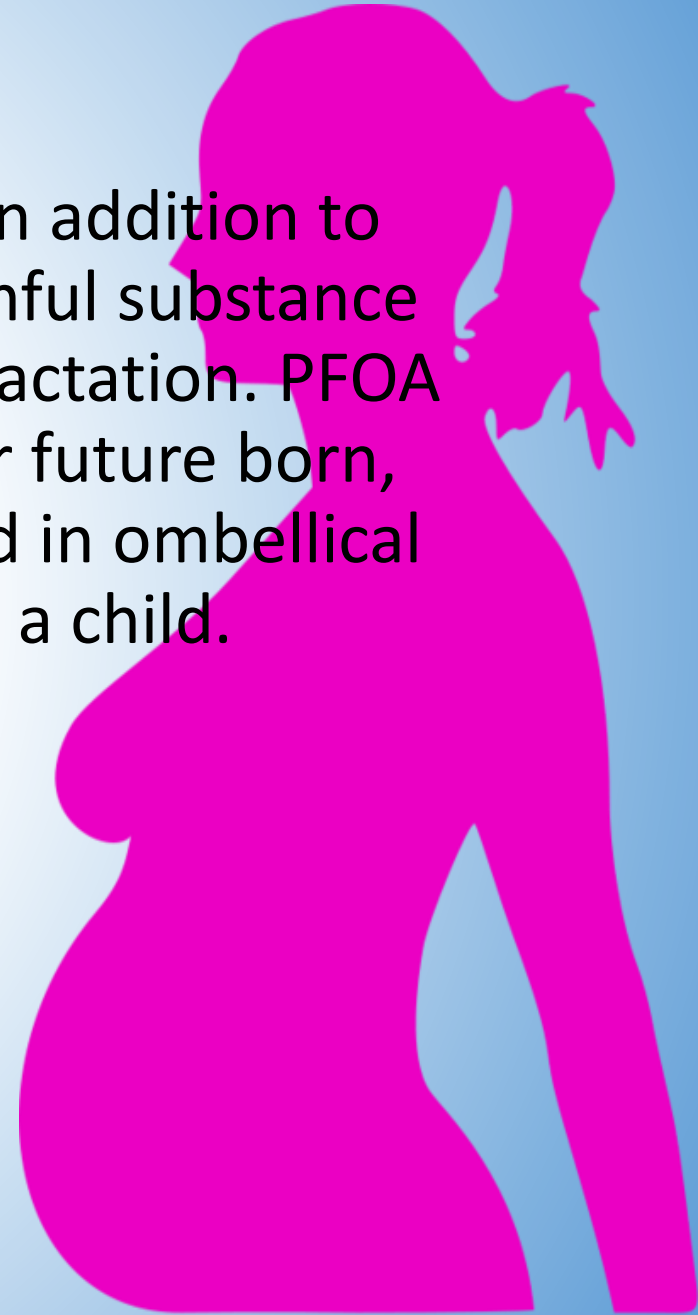
## **PFOA**

Many studies in recent years have looked at the possibility of PFOA causing cancer.



# DANGER TO HUMANS

The substances used in the production of Teflon in addition to being detrimental to the animals, represent a harmful substance for the humans, dangers also affect human during lactation. PFOA are feared especially for pregnant women than for future born, since residuals of this material have been identified in umbilical cords and in the blood of woman waiting for a child.



# PFOA

PFOA and some similar compounds can be found at low levels in some foods, drinking water, and in household dust. Although PFOA levels in drinking water are usually low, they can be higher in certain areas, such as near chemical plants that use PFOA.

People can also be exposed to PFOA from ski wax or from fabrics and carpeting that have been treated to be stain resistant. Non-stick cookware is not a significant source of PFOA exposure.



# SOME ALTERNATIVES

Some progress has been made in reducing PFCs. The EPA (The US **Environmental Protection Agency**) has been working with companies since 2000 to phase out PFOA and PFOS, and to reduce the environmental and human health impacts of other PFCs

PFOS is no longer manufactured in the United States, and PFOA production has been reduced and will soon be eliminated.

*The EPA has not officially classified PFOA as to its carcinogenicity. It says there is “suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential.”*



# Some advice:



- ✓ Stay away from greasy or oily packaged and fast foods, as the packages often contain grease-repellent coatings
- ✓ Avoid stain-resistance treatments
- ✓ Choose furniture and carpets that aren't marketed as "stain-resistant" Replace your non-stick cookware with stainless steel.
- ✓ PFCs can be found in dental floss and a variety of cosmetics, including nail polish, facial moisturizers, and eye make-up.
- ✓ Steer clear of personal care products made with Teflon or containing ingredients that include the words "fluoro" or "perfluoro."
- ✓ Choose clothing that doesn't carry Teflon Tell retailers to stop selling products made with PFCs and other chemicals.



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Thank you for your attention

- THE BALTI C SEA & environmental toxins - LESSONS TO LEARN STUDY GUIDE TO THE DOCUMENTARY The second wave
  - *The EFSA Journal* (2008) 653, 1-131
  - [http://healthvermont.gov/enviro/pfoa/PFOA\\_health\\_facts.pdf](http://healthvermont.gov/enviro/pfoa/PFOA_health_facts.pdf)
  - [https://www.niehs.nih.gov/health/materials/perflourinated\\_chemicals\\_508.pdf](https://www.niehs.nih.gov/health/materials/perflourinated_chemicals_508.pdf)
  - <http://www.cancer.org/cancer/cancercauses/othercarcinogens/athome/teflon-and-perfluorooctanoic-acid--pfoa>