



# DISRUPTING FOOD

Endocrine disrupting chemicals  
in European Union food



**PAN Germany**  
Pestizid Aktions-Netzwerk e.V.

**GLOBAL 2000**





## **ENDOCRINE DISRUPTORS; ENDOCRINE DESTRUCTORS?**

### **DEFINITION OF EDCS AND HEALTH CONCERNS**

DISRUPTED WILDLIFE...

MALE FROGS WITH FEMALE ORGANS,  
MALE FISH THAT ACTUALLY PRODUCE  
EGGS, MALE TURTLES WITH UNDEVEL-  
OPED PENISES, NOT ABLE TO REPRO-  
DUCE.

SOMETHING IS GOING WRONG OUT  
THERE. BUT WHAT IS IT, *THAT IS MAKING  
MOTHER NATURE LOOSE HER BALANCE?*

## Our Stolen Future...

In the early nineties a group of scientists collaborating with Theo Colborn<sup>1</sup> recognized that these mal-developments and malformations occurred more frequently in habitats with significant industrial pollution and that these abnormalities were linked to a certain group of hormone-mimicking chemicals. These chemicals have the capability to interfere with the body's endocrine system. One of the first substances that was identified as a so called Endocrine Disrupting Chemical was the pesticide DDT (dichlorodiphenyltrichloroethane). After contamination of Lake Apokpa in Florida by a local DDT- manufacturer, the number of Mississippi alligators (*Alligator mississippiensis*) was reduced by up to 90 %. Smaller penises and malformed testicles had led to decreased fertility and higher mortality of embryos, resulting in fewer crocodile babies.

1. Theo Colborn is a very famous American scientist, co-writer of *Our Stolen Future : Are We Threatening Our Fertility, Intelligence and Survival ? A scientific Detective Story* (1996), with Diane Dumanosky and John Perterson Meyers. The book brought world-wide attention to the phenomenon of endocrine disruption by synthetic chemicals. She is now Founder and President of the Endocrine Disruption Exchange (TEDX) in Colorado.

For more info: [www.endocrinedisruption.com](http://www.endocrinedisruption.com)

## What are EDCs ?

Endocrine Disrupting Chemicals (EDCs) are, as suggested by their names, chemicals that disrupt the hormonal system of the body (for both humans and wildlife), which is responsible for all vital features such as growth, sexual development, and even behaviour. By mimicking or altering the effects of hormones, EDCs can send confusing messages to the body, causing several dysfunctions.



Like the "real" hormones of the endocrine system, endocrine disrupting chemicals act in very small doses. For example, under laboratory conditions, a very low concentration (around 15 parts per billion) of Bisphenol A, one of the most ubiquitous endocrine disrupting chemicals, is enough to make water snails dramatically increase their egg production. Similar concentrations are frequently found in our environment. Considering these facts, it is not surprising that 2 out of 3 fish caught in Austrian rivers are now female.

Because one of the main effects of Endocrine Disruptors is to impair the reproductive system, the ubiquitous presence of these chemicals is a major threat to biodiversity worldwide and can accelerate the extinction of species on our planet.

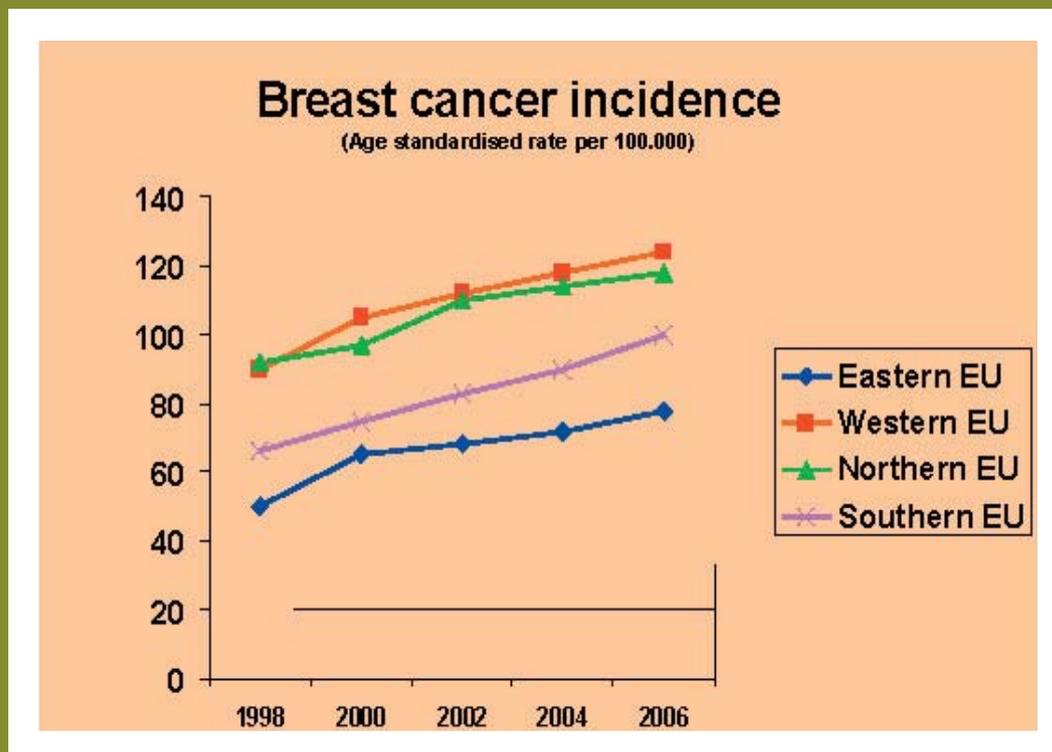


## DISRUPTED HUMANS

IF SO MANY EDCs ARE FOUND TODAY IN THE ECOSYSTEM, THIS IS BECAUSE THEY ARE USED IN THE PRODUCTION OF MANY COMMON PRODUCTS SUCH AS COSMETICS, TOYS, SHAMPOOS, OR FURNITURE LIKE PLASTIC COMPONENTS OR PRESERVATIVES, BUT ALSO PESTICIDES. CONSUMERS ARE DIRECTLY EXPOSED TO THESE CHEMICAL RESIDUES FROM PESTICIDES WITH ENDOCRINE DISRUPTING PROPERTIES AS THEY CAN NOT ONLY BE ABSORBED THROUGH THE SKIN BUT CAN ALSO BE INGESTED WITH THEIR FOOD EVERYDAY. WHAT ARE THE RISKS FOR THEM?

### DISRUPTION ALERT IN THE EU...

It is a fact: chronic diseases are on the rise. Breast and prostate cancers are the best documented examples of this in Europe but other diseases like diabetes, obesity, infertility and mental problems are surging as well.



SOURCE: EUGLOREH PROJECT, 2007, [www.eugloreh.it/default.do](http://www.eugloreh.it/default.do)



**The health concerns over EDCs**

Because the hormonal system regulates most of the features of the human body, EDCs affect the body on many different levels – just as it does for animals. Recent scientific reviews and official reports summarize the state of knowledge on endocrine disruptors<sup>2</sup>. Hormone-related cancers (prostate, testicular, breast), disturbance of metabolism (obesity, diabetes), reproductive dysfunctions (decreased fertility, early puberty for girls), cardio-vascular problems, but also behavioural and mental disorders (memory, motility, attention), are all potential effects of EDCs<sup>3</sup>. Some of these effects are still visible in the second or third generations, even though they have never been exposed directly to EDCs themselves<sup>4</sup>.

2. See Kortenkamp, "State-of-the-art assessment of endocrine disruptors", 2012 & European Environment Agency, Technical report No 2/2012: The impacts of endocrine disruptors on wildlife, people and their environments – The Weybridge+15 (1996–2011) report, see under: [www.eea.europa.eu/publications/the-impacts-of-endocrine-disruptors](http://www.eea.europa.eu/publications/the-impacts-of-endocrine-disruptors)

3. See statement from the Endocrine Society (Diamanti, 2009).

4. For more information on transgenerational effects, see: "Environmentally Induced Epigenetic Transgenerational Inheritance of Ovarian Disease", Eric Nilsson, Ginger Larsen, Mohan Manikkam, Carlos Guerrero-Bosagna, Marina I. Savenkova, Michael K. Skinner, School of Biological Sciences, Center for Reproductive Biology, Washington State University, Pullman, Washington, United States of America

**This rise cannot only be attributed to genetics. "Environmental" factors such as lack of exercise, stress; but also exposure to chemicals like EDCs should not be ignored any longer.**

**CHEMICAL COCKTAILS**

EDCs are more dangerous when acting together at the same time. Everyday, consumers ingest dozens of different EDCs through food, shampoos, furniture, etc...

Eating fruit or vegetables can mean ingesting on average residues from 20 different ED pesticides (see part 6. "Tracking down EDCs in food").

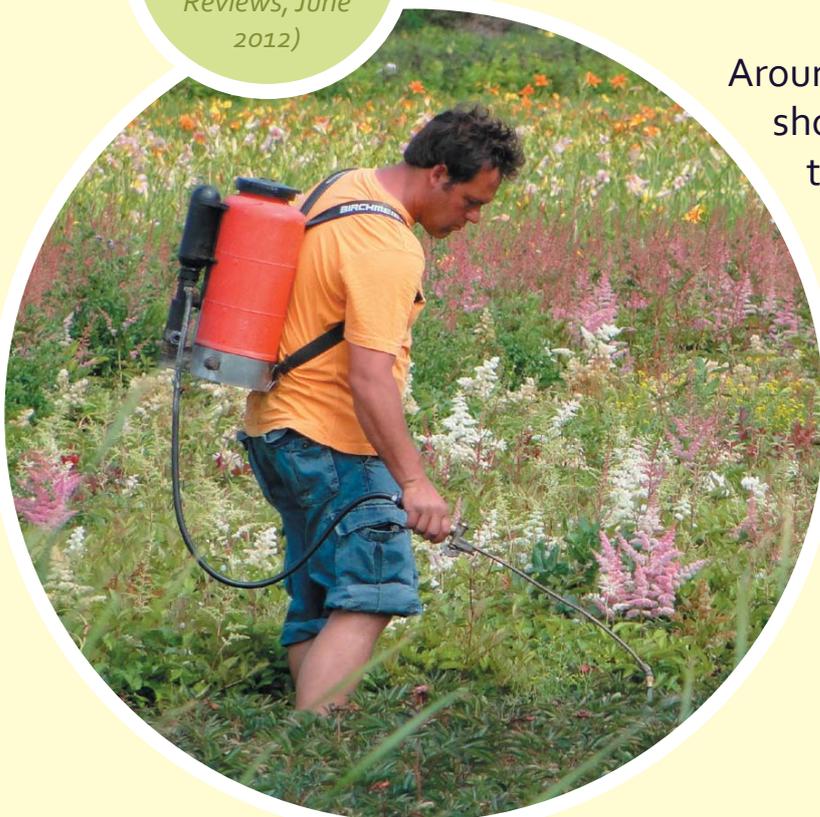
5. *Statement of the Endocrine Society (Endocrine reviews, June 2009), supported in 2011 (Science 331:1136) by 8 other societies representing 40.000 scientists*

The problem is that, as they add up, the effects of EDCs can "accumulate", leading to even more dangerous mixtures – the "cocktail effects". Despite scientific evidence supported by numerous experts<sup>5</sup>, the EU continues to ignore endocrine disrupting effects and cumulative effects when making decisions.

#### NO "SAFE" LEVEL OF EXPOSURE

One particularity of EDCs is that their effects can be observed at even very low doses. Despite scientific evidence of these low-dose effects<sup>6</sup>, the EU Commission currently adopts a "safe threshold approach", considering that EDCs are safe below a certain threshold. This approach overlooks the dangers of low-dose effects and is not suited for EDCs, especially with regards to exposure to children. Instead, "a wider range of doses, extending into the low-dose range, should be fully tested", as pointed out by a state-of-the-art study led by scientist Vandenberg<sup>7</sup>. These low-dose effects are a real threat for consumers' health, especially for the youngest whose defence systems are still developing (see next page).

6.-7. *Vandenberg/ Soto/Heindel/Vom-Saal ao. (Endocrine Reviews, June 2012)*



Around 40 pesticides in use in Europe show endocrine disrupting properties and 30 of them can be analysed in food as residues<sup>8</sup>. Today, only organic food items are free from these pesticides.

8. *List set up by PAN Europe according to the KEMI List and Mc Kinlay's review (2008 : McKinlay, R., Plant, J.A., Bell, J.N.B., Voulvoulis, N. Endocrine disrupting pesticides: implications for risk assessment. Environment international 2008; 34(2):168-83.) For more info, see page 18. « PAN method ».*

# NO DISRUPTION ALLOWED IN THE WOMB

## EDCS AND CHILDREN'S HEALTH

WHEN ASSESSING THE HARMFUL EFFECTS OF CHEMICALS SUCH AS PESTICIDE RESIDUES IN FOOD, ONE MUST KEEP IN MIND THAT CHILDREN AND THE UNBORN ARE NOT JUST "SMALL ADULTS"; THEY ARE MUCH MORE VULNERABLE.

### CHEMICAL PREGNANCIES

In fact, children are still in the process of developing their defence mechanisms against toxic substances. Therefore, if they are exposed to chemicals, these will potentially harm them more because they are less capable of detoxifying chemicals in their body and excreting them. The lower weight of children means that they can tolerate fewer chemicals than adults. Further, given their still developing defence mechanisms, even low exposure of toxic chemicals should be forbidden for children.

For a long time, policy makers assumed that the unborn were protected in the placenta and that chemicals were not able to pass through. But this assumption is false: in the last decades, scientists have indeed discovered that younger children and especially the unborn were even more vulnerable to chemicals. The unborn are exposed to chemicals. This is highly dangerous as they are in the first phase of developing life and they are making millions of choices that will affect their future body development. This is a very finely regulated process which cannot tolerate any mistakes. Hormones have a key « signalling » role in this fine process, making sure that the body is built up in a proper way. They act in very small doses and therefore small doses of endocrine disrupting chemicals might be enough to disturb their precious "work". Disrupting these processes with endocrine disrupting chemicals can result into huge health problems.

THE WOMB:  
A KEY "WINDOW  
OF EXPOSURE"

Along with this, it should be noted that many hormones have a signalling role with regard to the DNA. Disturbing these hormones can result in malformation of the brain, nerves, sexual organs and can lead to a higher vulnerability to develop cancers. The disturbance might not be noticed in the first years of the child's life but may affect him or her later during their life causing problems with motility, memory, Attention Deficit Hyperactivity Disorder (ADHD), infertility, etc. The only solution is to prevent any exposure of the unborn to chemicals.

#### ILLUSTRATING THE "CRITICAL WINDOWS OF DEVELOPMENT"

The Endocrine Disruption Exchange (TEDX) was founded by Theo Colborn, an eminent scientist specialized in endocrine disruption.

The website offers an interactive tool where users can see very precisely the timeline of the foetus development and all the critical "windows of exposure" during which the unborn are especially vulnerable to chemicals, including EDCs. For each stage of development, the graph shows which organs are vulnerable to which chemicals and the health effects observed in animal testing.

You can look for Chlorpyrifos, Bisphenol A or phtalates, which are all EDCs found in food items and materials.

#### THE « DES-DAUGHTERS » CASE

In the scientific world these effects have been known for a long time. The most 'famous' case is DES (Diethylstilbestrol), a chemical given to pregnant women in the 50s that was supposed to improve the chances of baby's survival. It turned out that DES was an endocrine disrupting chemical causing several adverse effects (vaginal cancer, pregnancy complications, infertility) and increasing the risk of breast cancer. Millions of young girls whose mothers had been using DES during pregnancy suffered from these effects in the US and in Europe ("DES-daughters"). Due to the delayed nature of these effects, this was only discovered many years later when the damage was already done.

You have to lower the risks yourself; and in case of food, choose for the best option:  
**ORGANIC**

European legislators

-70 years later- still have no effective legislation in place to prevent exposure to endocrine disrupting chemicals.



Go to: [www.criticalwindows.com/go\\_display.php](http://www.criticalwindows.com/go_display.php)

# UNDERSTANDING THE EUROPEAN LEGISLATION ON PESTICIDES

## LOOPHOLES AND STEPS TO BE TAKEN IN THE FUTURE

### WHAT DOES THE EUROPEAN UNION DO CONCERNING PESTICIDES?

The European Union started harmonising the authorisation of pesticides in agriculture of its 27 members in 1991, with a revision in 2009. In addition, the EU has harmonised standards for pesticides residue limits in food.

### WHAT RULES ARE APPLIED TODAY WHEN IT COMES TO THE USE OF PESTICIDES IN EUROPEAN AGRICULTURE?

*The Plant Protection Products Regulation* (Regulation EC 1107/2009, implemented in June 2011, following the former Directive 91/414) is the first piece of legislation. It is a two-step regime : first, the active ingredients are approved on the EU-level; then, pesticide products need to be backed up by national or zonal authorisations, taking into account the context in which the pesticide will be used.

One major improvement in the new legislation is the “cut-off” criteria. According to this rule, chemicals must be banned if safety testing shows that they have extremely dangerous properties for humans or the environment (not breaking down very quickly, accumulating in the living body, disrupting the hormonal system, having irreversible effects on the environment...). This concerns a specific group of chemicals for which EU politicians considered that the risk was simply too high and that nor humans or the environment should get exposed<sup>1</sup>. Only in very special cases of ‘closed systems’ where they cannot escape from, use might be allowed.

1. For more info on the legal text and the pesticides concerned, go to: [http://www.pan-europe.info/Campaigns/pesticides/cut\\_off.html](http://www.pan-europe.info/Campaigns/pesticides/cut_off.html)

## SO HOW MANY PESTICIDES ARE ALLOWED IN THE EUROPEAN UNION?

First the number of pesticides was reduced from around 1000 (historical situation) to 250, mainly because companies didn't want to pay for safety tests and commercial interest was low. A few dozens pesticides didn't meet the standards and were not approved.

Today, the number of pesticides is on the rise again, now reaching

over 350. This is because regulators are lowering the standards for approval, by allowing high risks for the environment for instance. Additionally many exceptions are given, even allowing use of illegal pesticides such as the soil fumigant 1.3-Dichloropropene. The new criteria of Regulation 1107/2009 are not yet implemented and many dangerous pesticides like those that disrupt the hormonal system are still on the market.

## WHAT ABOUT THE PESTICIDES THAT ARE STILL USED, ARE THERE ANY RULES TO LIMIT THEIR PRESENCE IN OUR FOOD?

Yes there is a second piece of legislation. It is the Regulation on maximum residue levels (MRLs) of pesticides in or on food and feed of plant and animal origin (396/2005/EC). The residue of chemical products used for agriculture should be safe for consumers' health and be as low as possible (in order to expose human at the lowest possible level). MRL is the limit; no pesticide residue is allowed to be higher than the MRL in food for humans as well as for animals. In 2008 all MRL's were harmonised in Europe but the outcome was not an overall lowering of MRL. In fact, LMR rose in several member states. In Austria, for instance, more than 65% of pesticides ended up with higher MRL



than before. This was very advantageous for importers and exporters but it soon turned out many harmonised MRL's were put at a dangerous high level. In reaction to NGO's mobilisation, the EFSA is now lowering many MRL's again.

Unfortunately many pesticides still authorised have very negative health effects : for instance mancozeb is a multi-active carcinogen, capable of causing at least eight different types of cancer like the mammary cancer, liver, pancreas, thyroid, etc<sup>2</sup>. Another one is the carben-dazim, which, for a long time, has been known to cause adverse effects on the male reproductive systems, including reduced epididymal sperm counts and fertility in the rats<sup>3</sup>. Both these chemicals have been found on the top ten contaminated fruits and vegetables of our analysis.

### BUT THERE IS MORE THAN ONE PESTICIDE PER PRODUCT, ISN'T THERE?

Absolutely and this is another problem with this legislation. In fact, these lowered MRL's are not really safe since European Union does not take into account the cocktail (cumulative) effects at all. This means that the health risk linked to the combination of different residues is not considered although this is required in the 2005-Regulation. EFSA has delayed the inclusion of cumulative effects for 7 years already, putting people at more risk every day.

### DOES THE REGULATION APPLY TO PRODUCTS ONLY FROM THE EUROPEAN UNION?

It is important to notice that MRL-rules concern not only food and feed produced within the European Union borders, but also products imported from other countries.

### FINALLY WHAT IS THE NEXT STEP TO PROTECT OUR HEALTH IN THE EUROPEAN UNION?

The next step is the implementation of the legislation concerning pesticides with endocrine disrupting properties and establishing the criteria for this effect. A similar approach has been determined for household pesticides according to the new EU Biocide Regulation<sup>4</sup>.

Commission has to come up with draft criteria for EDCs by December 2013.

This shows quite well that European law is very slow in implementing laws to protect its citizens' health. Criteria will be followed by testing obligations for pesticides. Banning an endocrine disruptor will be considered after tests and evaluations only. This means that it will actually take years until most of the ED pesticides listed in this guide will disappear from our food.

2. See Belpoggi, 2002.

3. See Gray, 1990, Lazzary, 2008, Moffit, 2007, Yu, 2009

4. PAN Germany (2012): The European Union's new Regulation on biocides: [www.pan-germany.org/download/biocides/new\\_european\\_regulation\\_on\\_biocides.pdf](http://www.pan-germany.org/download/biocides/new_european_regulation_on_biocides.pdf)

## PART 4



## TOXIC FOOD PACKAGING EDCS IN PLASTICS

ALONG WITH PESTICIDES THAT FIND THEIR WAY INTO YOUR FOOD, DIFFERENT KINDS OF PLASTICS ARE ANOTHER POTENTIAL SOURCE OF ENDOCRINE DISRUPTING CHEMICALS THAT YOU ENCOUNTER IN YOUR EVERYDAY LIFE.



## CONSUMER TIPS

There is an increasing scientific body of evidence showing that it is worth trying to minimize the exposition to these chemicals, especially regarding small children and pregnant women.

Here are some tips:

Avoid articles made of Polycarbonate or Polyvinylchloride, especially when they are designed to store food (like in refrigerators, containers) and come into contact with young children. You will identify them by their recycling code 6, or by the symbols PC and PVC, respectively.



Prefer glass over plastic: Since plastic materials other than the above mentioned could possibly release BPA or Phtalates, the safest way to avoid those EDCs is to use glass bottles and glass containers.

Use "BPA-free" pacifiers: With the exception of Austria, all over the European Union pacifiers containing BPA are still legal on the market. Be sure only to use pacifiers that are indicated as "BPA-free".



Among the most important EDCs found in plastics are :

- Phtalates (a group of chemicals that are added to plastics, especially PVC, to increase flexibility, transparency, and longevity)
- Bisphenol A – used as starting material for the production of Polycarbonate and "Epoxy resins", and also sometimes added in other materials, like Polyamid, Silikon and Latex

Phtalates and Bisphenol A are present in human blood or urine as well as in human breast milk and in cord blood of newborn babies. Completely avoiding contact with these chemicals is almost impossible, since they are produced worldwide in millions of tons every year and used in a huge number of products, such as toys, water bottles, eyeglass lenses, CDs/DVDs, cell phones, consumer electronics, household appliances, automobiles, etc.



Reduce your consumption of canned food. The inner side of tin cans is coated with a thin layer of plastic, mostly consisting of epoxy resins, that release BPA into the food. It does not have to be that way: In Japan, because of health concerns, epoxy resins in tin cans have been replaced by a BPA-free plastic layer. And Nestlé recently announced that it would abandon BPA for its whole food assortment. But only for the US market...

IT'S TIME  
TO WRITE A LETTER TO  
FOOD INDUSTRIES RE-  
PRESENTATIVES, TELLING  
THEM THAT WE DO NOT  
WANT TO BUY THEIR ENDO-  
CRINE DISRUPTING FOOD  
NO MORE.



Keep spot slips away from small children. Cash slips used in most supermarkets and ATM contain BPA concentrations in the double-digit % range. Since BPA is absorbed through the skin, cashiers in supermarkets are subjected to particular strain. Also small children, when putting the spot slip into the mouth.

ASK YOUR  
SUPERMARKET IF IT  
ALREADY USES BPA-  
FREE CASH SLIPS /  
OR SPOT SLIPS, OR,  
IF NOT, WHEN IT  
WILL DO SO.



Avoid food packaged with PVC film: Make sure that your local supermarket does without PVC films for food packaging. If not, demand the use of safer alternatives; they do exist! When buying budget films for your home, make sure that they do not contain phthalates.

## WATCH OUT: END PESTICIDES ON THE LOOSE! THE PROCHLORAZ CASE

WHAT IS  
 $C_{15}H_{16}Cl_3N_3O_2$ ?

Prochloraz is a fungicide widely used to grow basic crops in the EU. It belongs to a group of similarly acting pesticides known as “the conazoles”.

WHAT  
EFFECTS DOES  
PROCHLORAZ  
HAVE ON OUR  
HEALTH?

Just like all conazoles, Prochloraz has several special properties that disrupt the hormone system. Its main negative effects are the feminisation of male offspring and sexual malformations. This was not only demonstrated in animal testing : Danish women working in greenhouses also showed similar effects. Foetuses are especially vulnerable. The exposure of unborn babies to prochloraz may lead to negative effects in later life such as an altered behaviour<sup>1</sup>.

Along with this, Prochloraz is suspected of other harmful effects, such as disruption of thyroid hormones with a possible impact on brain development<sup>2</sup>. As is often the case with endocrine disruption, adverse effects are observed even at very low doses, making it impossible to consider a “safe” level of exposure. Further, the effects of prochloraz tend to combine with those of other chemicals, leading to even more dangerous “cocktail” effects.

1. Vinggaard et al., 2006  
2. Ghisari et al., 2005

SO, WHY IS  
PROCHLORAZ  
STILL ON THE  
MARKET?

Despite alarming evidence from scientific studies, Prochloraz is an approved pesticide, available on the European Union market and widely used in agriculture. In fact, it was re-registered by the Commission in January 2012 for 10 years. Industries smartly took advantage of one of the many loopholes in pesticides regula-

tion: the “re-submission” regime. This regime allows companies to “voluntarily withdraw” their products from the market and to submit it for a second assessment. In the meantime, however, the products are not actually banned. Instead, they benefit from an “extended phase out” and a specific registration procedure that only requires them to submit a “mini-dossier” for their product to be re-assessed – and, in the majority of the cases, re-approved. New regulation 1107/2009 states that endocrine disrupting pesticides will be banned, and Prochloraz just escaped these new rules for the next 10 years.

PAN Europe asked for a review of the approval of prochloraz in December 2011, arguing that, according to the rules, the Commission has to consider current scientific knowledge and ensure harmful effects on humans are prevented<sup>3</sup>. The flaws of the re-submission regime were also pointed out as an argument to reassess prochloraz. The request was rejected by Commission.

As a response, PAN decided to bring the Prochloraz case to the European Court of Justice in Luxembourg. The appeal was sent by lawyer Mr. J. Rutteman on May, 2nd 2012 and the court case is now being reviewed.

3. Regulation  
1107/2009, art.4.1



THE  
RE-SUBMISSION  
REGIME : A BACKDOOR  
FOR CONTROVERSIAL  
PESTICIDES

In April 2012, PAN Europe published a special report on “re-submission”, pointing out how companies are using this regime as a backdoor to get their products approved in cases where data and test requirements are lacking.

« Twisting and bending the rules »  
[www.pan-europe.info/  
Resources/index.html](http://www.pan-europe.info/Resources/index.html)

A TASTE OF  
PROCHLORAZ...

Prochloraz residues are found in several food items. The most polluted ones are apples, peppers and strawberries, but residues are also found in beans, cauliflowers, mandarins and oranges. (EFSA, 2009).

THE  
“COMEBACK” OF  
PROCHLORAZ

**5 DECEMBER 2008** Commission denies approval to Prochloraz.

**29 MAY 2009** BASF Agro B.V. and Makhteshim Agan « voluntarily withdraw » Prochloraz from market and apply to the « re-submission » regime.

**JULY 2010** Ireland, the rapporteur member state, re-examines Prochloraz and drafts an additional report sent to Commission and the European Food Safety Authority.

**13 AUGUST 2010** EFSA makes the report available and holds consultation.

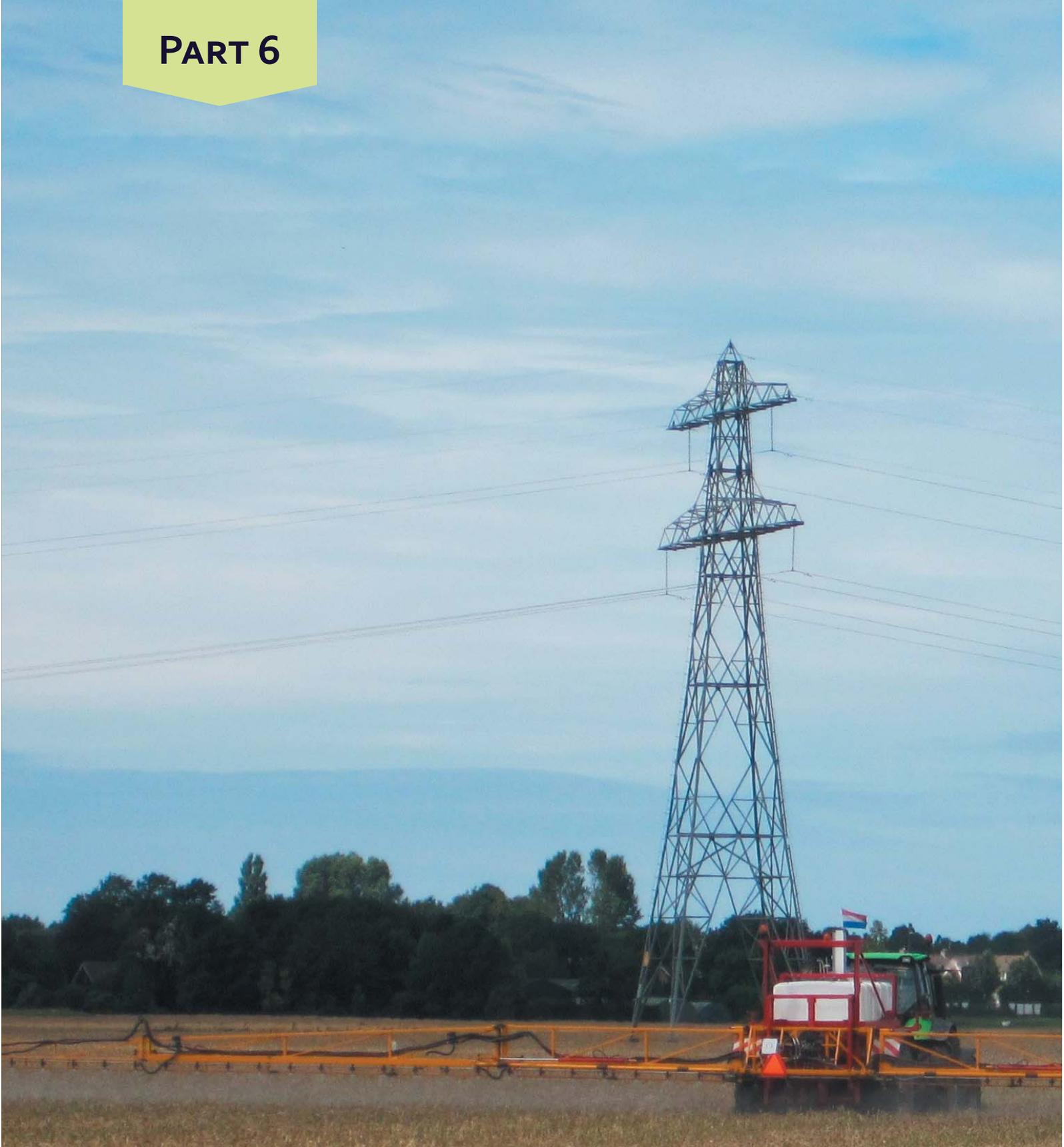
**27 SEPTEMBER 2011** Final examination by the Standing Committee on the Food Chain and Animal Health.

**NOVEMBER 2011** Prochloraz gains re-registration from European Commission.

**JANUARY 2012** Prochloraz is re-approved – with limited new requirements in the case of outdoor uses.

**MAY 2012** PAN Europe brings Prochloraz case to the EU Court of Justice in Luxembourg. The case is now running.

## PART 6



## TRACKING DOWN EDCs IN EUROPEAN FOOD...

PAN EUROPE'S METHOD EXPLAINED TO CONSUMERS

Step 1 :  
identifying pesticides with endocrine disrupting properties (ED pesticides)

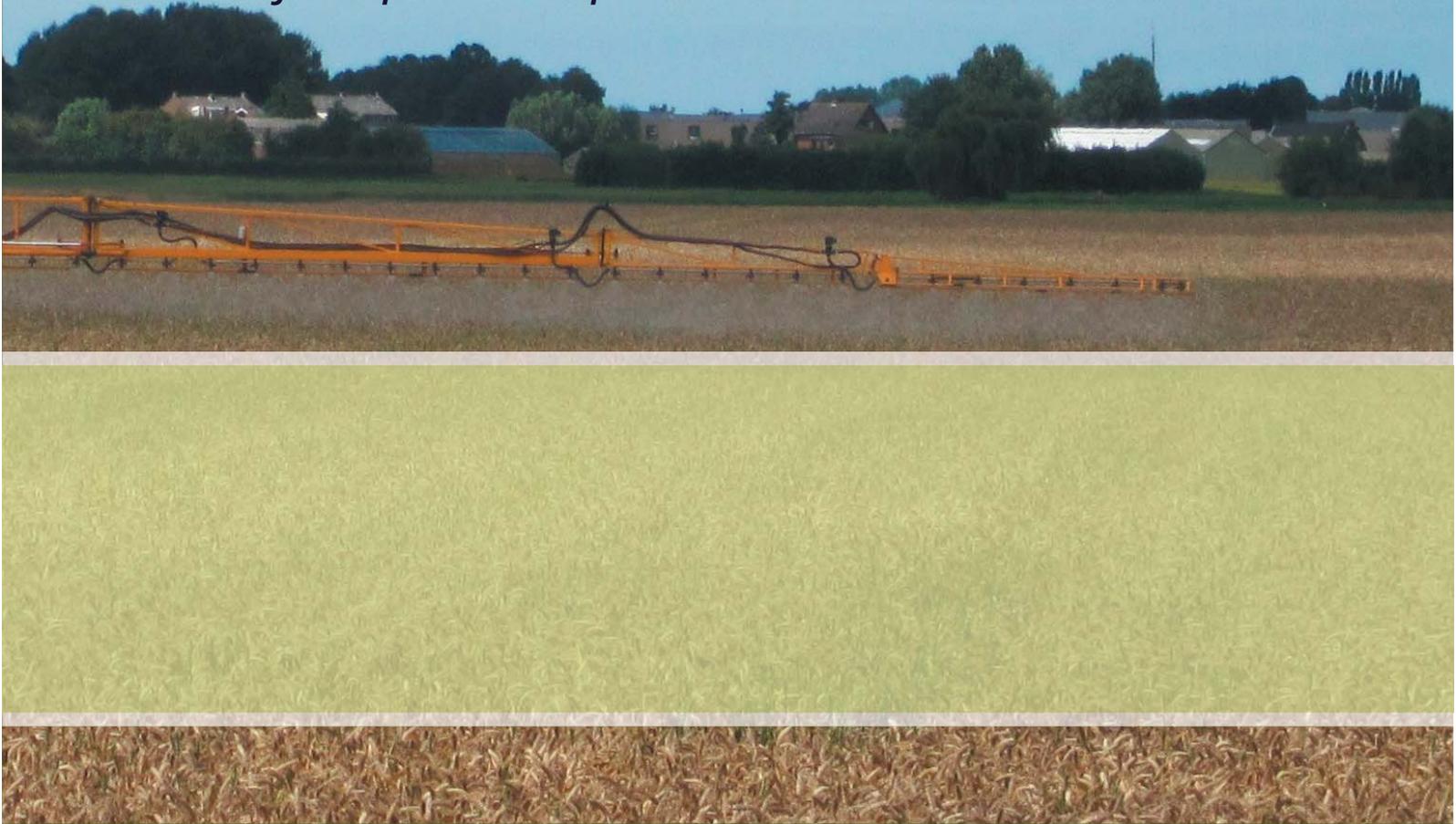
Given the fact that the EU does not currently have a list of specific criteria to define EDCs for now, we had to set up our own list of endocrine disrupting pesticides. To do so, we combined all available sources, open literature - studies published by academia - and 'grey' literature – studies done in the process of pesticide evaluation.

For both sources, reviews are available and we chose these two:

**THE KEMI LIST (2008)** the Swedish Chemicals Agency has collected all cases on endocrine disrupting pesticides from the evaluation dossiers for pesticides. These dossiers are mainly based on mandatory safety testing of pesticides done by the industry themselves.

**MC KINLAY'S REVIEW OF THE SCIENTIFIC RESEARCH ON EDCs FROM OPEN LITERATURE : 2008** McKinlay, R., Plant, J.A., Bell, J.N.B., Voulvoulis, N. Endocrine disrupting pesticides: implications for risk assessment. Environment international 2008; 34(2):168-83.

Based on these sources, **PAN identified as many as 43 different potential ED pesticides.**



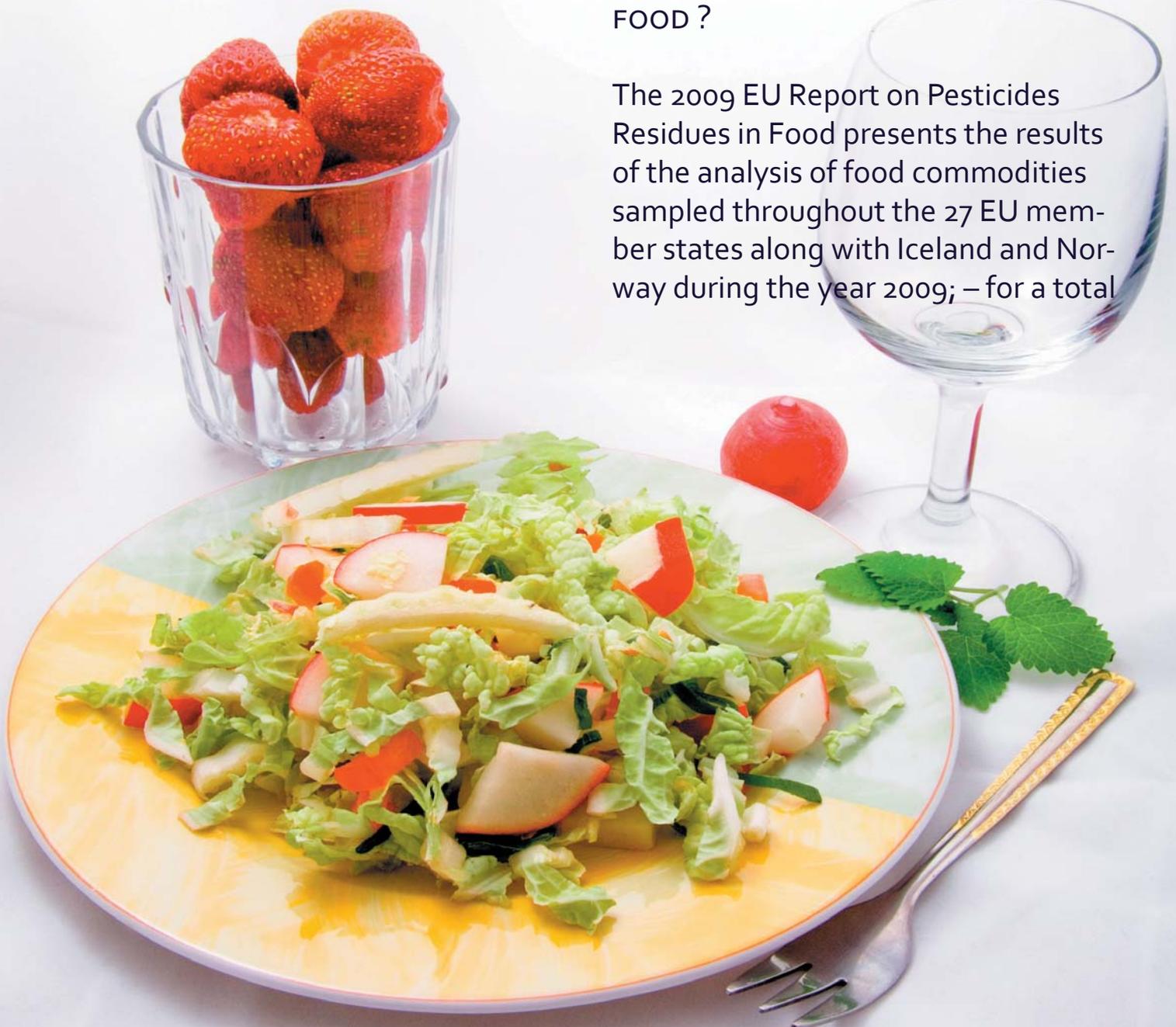
Step 2  
collecting  
residues in  
European  
food items

Note :  
because the data did not seem plausible in the official online version, we sent a request to the EFSA for a complete review. It turned out that there were printing errors in the data and a new revised version was sent to us. We are happy to send a copy to interested readers.

With our new list of ED pesticides, we started looking for residues from these 43 pesticides in food items in the European Union. We based our research on a report from the European Food Safety Agency (EFSA) analysing food samples in the EU (including fruits, vegetables, cereals, milk and eggs). In total, 30 food items were assessed and the data could be used for our ranking of endocrine contaminated food.

### WHAT IS THE EFSA MONITORING REPORT ON PESTICIDES RESIDUES IN FOOD ?

The 2009 EU Report on Pesticides Residues in Food presents the results of the analysis of food commodities sampled throughout the 27 EU member states along with Iceland and Norway during the year 2009; – for a total



of about 70,000 food samples. The report combines data collected at both European and national levels, giving a good picture of the overall exposure to pesticides residues. The majority of the samples include food items produced in the EU itself (74% of samples), but also some imported food items and a slight proportion of organic commodities (about 5%).

For each of the 27 analysed food items, EFSA calculates the « long term » exposure of European citizens to pesticides residues. This means that we know the approximate level of pesticides residues ingested by consumers through tomatoes, peppers, etc. in the long run.

*Step 3  
presenting the  
results of long-  
term exposure  
to the consu-  
mers*

Out of the 43 endocrine disrupting pesticides, 30 were identified in European food (including fruits, vegetables, cereals, milk and eggs).

*Around half of our food is contaminated with pesticide residues, and 25 % of our food has even multiple pesticide residues, sometimes containing even more than 10 pesticides in one food sample. That is for one single portion. But what about the amount of pesticides residues ingested in the long run ?*

*The data shows that the consumption of some food items, like peppers, could lead to exposure in the long term to more than 20 different pesticides. Lettuce happens to be exposed to the highest level of endocrine disruptors. Given the exposure through many food items*

*at the same time, exposure to mixtures is also very likely.*

In order to inform consumers and give them a choice, we decided to set up a « ranking » of the 10 most « disrupting » food items; that is the 10 food items with the highest level of ED pesticides based on the “long-term” data of EFSA. Note that we excluded mandarins and oranges from our ranking based on the argument that most of the pesticides are contained in the skin of these fruits which are systematically peeled off.

Our complete data with the list of all food commodities and their level of ED pesticides in details is accessible for the public online at:  
[www.disruptingfood.info](http://www.disruptingfood.info)

**By doing this, we want to show consumers, especially pregnant women and children, that food is a major source of exposure to EDCs and to help them cook healthier meals. At the same time, we aim to encourage producers to reduce their use of ED pesticides, following the good practices of organic farmers and to support integrated pest management. Consumers should be aware that all conventionally grown fruits and vegetables include many kinds of pesticides residues and that eating organic remains the ultimate safe solution.**

**WE HOPE  
THAT THIS WILL BE A  
FIRST STEP TOWARDS A  
NEW ERA OF EUROPEAN  
AGRICULTURE, TOTALLY  
FREE OF HARMFUL  
PESTICIDES.**

**TOP 10 MOST «DISRUPTING» FOOD ITEMS**

**RANKING OF EU FRUITS AND VEGETABLES ACCORDING TO THEIR LEVEL OF ED PESTICIDES RESIDUES**

**TOMATO**

Bifenthrin 1. 11. Flutriafol  
 Captan 2. 12. Iprodione  
 Carbendazim 3. 13. Methomyl and  
 and Benomyl Thiodicarb  
 Chlorothalonil 4. 14. Myclobutanil  
 Chlorpyrifos-methyl 5. 15. Oxamyl  
 Cypermethrin (sum) 6. 16. Penconazole  
 Cyproconazole 7. 17. Propamocarb (sum)  
 Deltamethrin 8. 18. Pyrimethanil  
 Dimethoate (sum) 9. 19. Pyriproxyfen  
 Dithiocarbamates 10. 20. Tebuconazole  
 (Mancozeb)

**2.**

**CUCUMBER**

Bifenthrin 1. 11. Iprodione  
 Captan 2. 12. Methomyl and  
 Carbendazim 3. Thiodicarb  
 and Benomyl 13. Myclobutanil  
 Chlorothalonil 4. 14. Oxamyl  
 Chlorpyrifos-methyl 5. 15. Penconazole  
 Cypermethrin (sum) 6. 16. Pirimicarb (sum)  
 Cyproconazole 7. 17. Propamocarb (sum)  
 Deltamethrin 8. 18. Pyrimethanil  
 Dimethoate (sum) 9. 19. Pyriproxyfen  
 Dithiocarbamates 10. 20. Tebuconazole  
 (Mancozeb)

**3.**

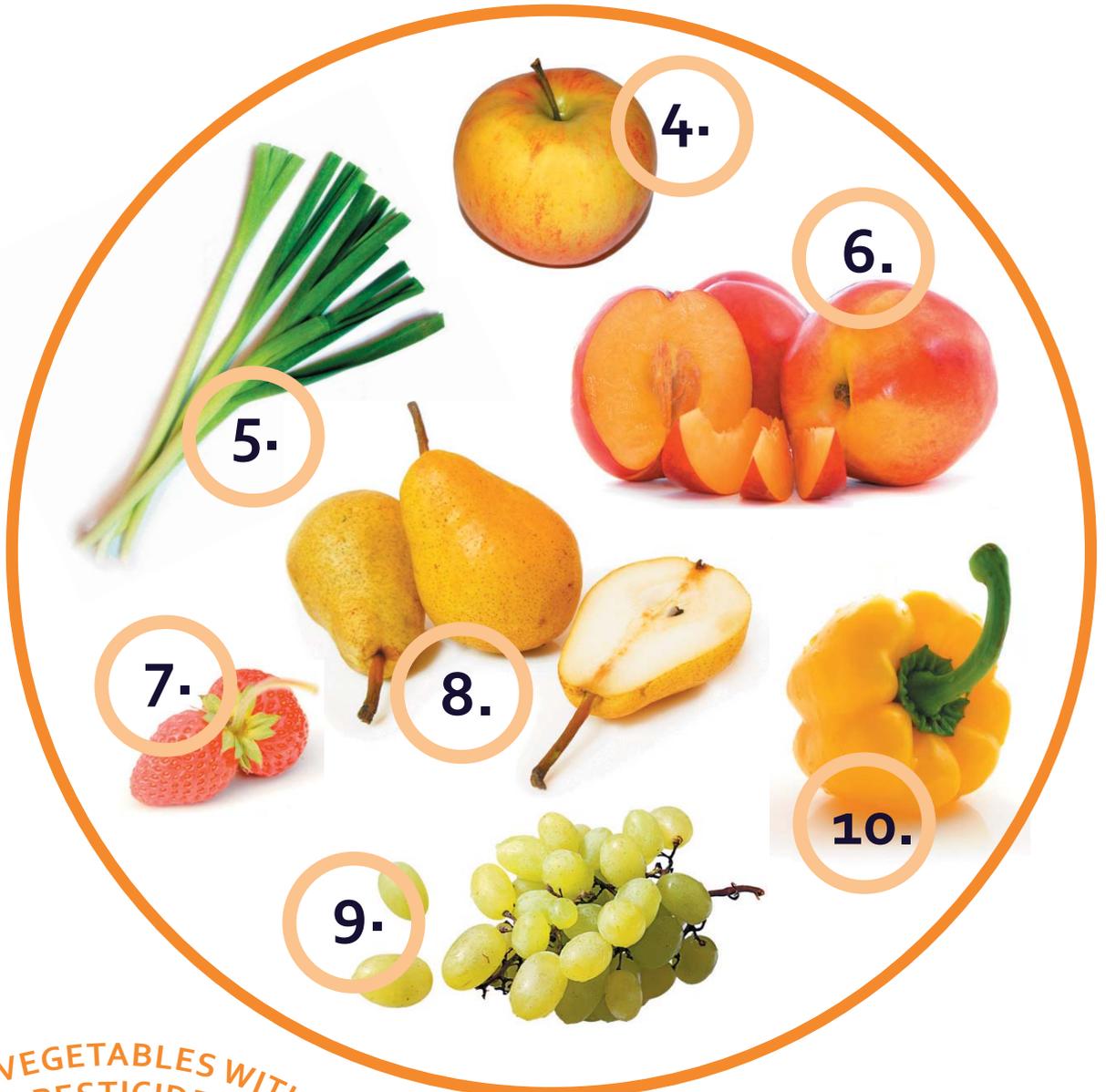
**LETTUCE**

Bifenthrin 1. 11. Flutriafol  
 Captan 2. 12. Iprodione  
 Carbendazim 3. 13. Linuron  
 and Benomyl 14. Methomyl and  
 Chlorothalonil 4. Thiodicarb  
 Chlorpyrifos-methyl 5. 15. Myclobutanil  
 Cypermethrin (sum) 6. 16. Pirimicarb (sum)  
 Cyproconazole 7. 17. Propamocarb (sum)  
 Deltamethrin 8. 18. Pyrimethanil  
 Dimethoate (sum) 9. 19. Tebuconazole  
 Dithiocarbamates 10. 20. Tolclofos-methyl  
 (Mancozeb)

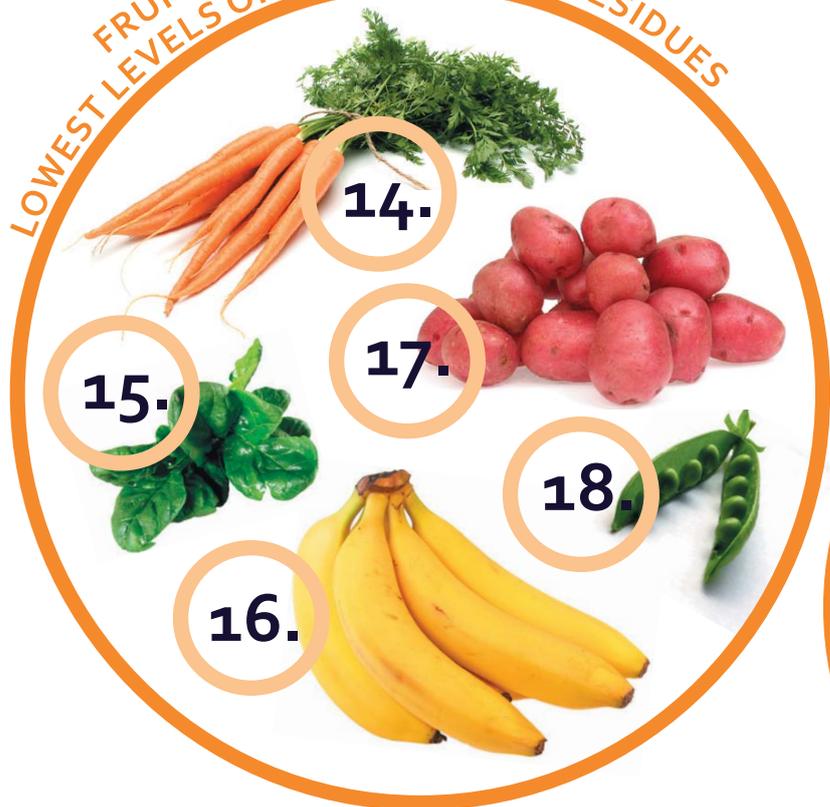
**1.**

«Sum » means that EFSA calculated a sum of similarly acting chemicals. For dithiocarbamates, the "sum" is the sum of the individual amounts of dithiocarbamate chemicals, including the ED pesticide mancozeb.





LOWEST LEVELS OF ED PESTICIDES WITH  
FRUITS AND VEGETABLES WITH



Want to know more about ED pesticides in your food? You can have access to PAN Europe complete data online on our campaign webpage. For each of the 27 food items, find out the list of ED pesticides and their concentration level. [www.disruptingfood.info](http://www.disruptingfood.info)



## HOW TO LIMIT YOUR EXPOSURE TO ED PESTICIDES?

### SOME TIPS TO INGEST FEWER PESTICIDES RESIDUES IN YOUR EVERYDAY LIFE

AS CONFIRMED BY OUR DATA, THERE ARE STILL MANY PESTICIDE RESIDUES IN THE FRUITS AND VEGETABLES THAT WE EAT EVERYDAY. HERE ARE SOME TIPS IN ORDER TO AVOID EXPOSURE, AT LEAST IN PART, KEEPING FRUITS AND VEGETABLES A SYNONYM OF HEALTHY FOOD.

## WHY?

Organic production is completely free of synthetic pesticides. Food items are grown according to very strict set of rules which guarantee that harmful chemicals are not used. PAN Europe therefore strongly encourages consumers to eat organic to the highest extent possible, especially pregnant women and children.

## How?

Today, most of the supermarkets offer organic food items. These are certified "organic" by the European Organic Label. This label for organic agriculture guarantees that no synthetic pesticides or fertilizers are used to produce food. Additionally, it guarantees an agriculture respectful of nature and of animals (no use of antibiotics and higher standards of animal welfare).

The best is to go to specialized food retailers that sell organic food exclusively. More and more grassroots associations in Europe offer food grown by local producers which is often organic: AMAPs in France, GASAPs in Belgium, CSAs in the UK... Shopping there is not only good for your health, but also for your community and for the environment at large, because it promotes local and seasonal production.

TIP 1:  
EAT ORGANIC!



For more detailed information about the overall benefits of organic production, visit: [http://www.ifoam.org/growing\\_organic/1\\_arguments\\_for\\_oo/arguments\\_main\\_page.html](http://www.ifoam.org/growing_organic/1_arguments_for_oo/arguments_main_page.html)



If you do not consume organic products only, you can always set priorities:

TIP 2

Avoid eating non-organic products which often contain pesticide residues such as lettuce, tomatoes, cucumbers and apples –especially for children and pregnant women. Use our “ranking” and prefer spinach over lettuce, carrots over tomatoes, etc. (see part 7)

TIP 3

Make sure that small children do not put unpeeled citrus fruits into their mouth: they could encounter high amounts of EDCs on the shell surface of these fruits.

TIP 4

Peeling reduces the pesticide load of conventional fruits and vegetables. Apart from systemic pesticides that go through the skin and flesh of food items or plants, pesticides residues are indeed mostly concentrated in the skin of the products.

TIP 5

Wash your products. Even though this will not take away all the pesticides, systematic washing definitely helps and is always a good habit to keep in mind.

TIP 6

You can feed babies with specific babyfood because the EU law sets stricter residue limits for pesticides in processed babyfood. For fresh fruits and vegetables, there is no such protection because these food items only need to meet the EU's standard requirements.

TIP 7

Do not hesitate to use your right as consumers: write to your supplier to know how many and what kinds of pesticide residues there are on the products they sell or to ask for more organic products (you may find letter for example on our website [www.disruptingfood.info/join-the-campaign](http://www.disruptingfood.info/join-the-campaign) )

100%  
ORGANIC



### **MAKING OUR HOMES FREE FROM EDCs!**

#### **WAYS TO AVOID EDCs FROM HOUSEHOLD PESTICIDES**

AS SHOWN THROUGHOUT OUR GUIDE, FOOD IS A MAJOR SOURCE OF EDCs. YOUR KITCHEN IS NOT THE ONLY PLACE WHERE THESE CHEMICALS ARE FOUND, THOUGH. EVERYDAY, WE SPRAY SEVERAL DIFFERENT KINDS OF ED PESTICIDES AT HOME – CALLED BIOCIDES. IN ORDER TO LIMIT EXPOSURE TO A MINIMUM, YOU HAVE TO BE CAREFUL WHEN MANAGING PEST CONTROL AND TO GO FOR NON-CHEMICAL ALTERNATIVES.



## THE DANGERS OF "SPRAYING" EDCs AT HOME

At one time or another, everyone will be faced with pest control issues at home. Many people use commercial pest control products to get rid of unwanted "guests" such as moths, ants, cockroaches, or rodents. But many of these biocidal products contain ingredients similar or identical to pesticides that are harmful to humans, pets and the environment. They are irritant, toxic to the nervous system, suspected of causing reproductive damage or cancer, and several are already identified as suspected endocrine disruptors. Several studies have shown that indoor dust is often contaminated by persistent and endocrine-disrupting chemicals including household pesticides.

Endocrine household pesticides are e.g. the organophosphate insecticides Dichlorvos, Diazinon or Dimethoate. Synthetic pyrethroids are another widely used class of insecticides de-

signed to be more toxic and longer lasting than the natural-based pesticide pyrethrum, and therefore are more potent to insects and pose more risks to humans. Many pyrethroids have been linked to disruption of the endocrine system. According to the European Commission, endocrine disruptor pyrethroids are Bifenthrin, Cyhalothrin, Deltamethrin, Resmethrin and suspected EDs are Bioallethrin, Cypermethrin, Fenothrin, Fenvalerate, Fluvalinate, and Permethrin<sup>1</sup>. However the natural-based pesticide pyrethrum, made from extracts from plants in the chrysanthemum family is not a useful alternative because these products often contain the suspected endocrine disruptor piperonyl butoxide (PBO, also identified as possible carcinogen and reproductive toxin).

1. EC (2004):  
COMMISSION STAFF  
WORKING DOCUMENT on implementation of the Community Strategy for Endocrine Disruptors - a range of substances suspected of interfering with the hormone systems of humans and wildlife (COM (1999) 706).  
SEC(2004) 1372: [http://ec.europa.eu/environment/endocrine/documents/sec\\_2004\\_1372\\_en.pdf](http://ec.europa.eu/environment/endocrine/documents/sec_2004_1372_en.pdf)

### CONSUMER TIPS

Prefer Alternatives and Prevention

#### Pest control step by step

- 1) Identify the pest species
- 2) monitor (e.g. by pheromone traps) and evaluate the pest problem
- 3) use independent information and advisory services
- 4) start adequate measures to stop the pest infestation and implement preventative measures
- 5) finally monitor the success of the activities.



Harmful pests such as cockroaches, bed bugs, pharaoh's ant or rats should be controlled only by a professional, certified pest controller.

Control more harmless pests such as pests in food or materials (e.g. moths, bugs) or unwanted organisms (e.g. silverfish, sow bugs or flies) with less harmful products and non-chemical alternatives.



### Examples:

» against insects, you can use diatomaceous earth (diatomite) or organic insecticides like neem tree oil. If you look for useful repellents, go for common lavender, lavender oil or cedarwood. To get rid of clothes or food moths, you can count on the help of the tiny parasitoid wasp *Tricogramma evanescens*, which is their natural enemy in wildlife<sup>2</sup>.

» combat clothing and food moths with the beneficial wasp *Tricogramma evanescens*, or use repellents such as lavender and cedarwood;  
» trap flies with adhesive strips and traps;  
» use baking powder-sugar-mixture against ants; they are good alternatives.

*2. The wasps place their own eggs beside those of the moths; when hatching, their larvae eat the moth eggs. The wasps are harmless to humans, measuring only about 2 mm. Once all moth eggs are eaten, the wasps vanish within 2-4 weeks. Wasps can be purchased in special retailers.*

### Prevention measures:

Make sure to seal off pest entry to your home, e.g. use weather-stripping around windows and doors, ventilate your living rooms frequently, repair leaky pipes and plumbing, clear out and wipe out cupboards and wardrobes frequently, don't leave out dirty dishes, store food (including pet food) in sealed containers, empty dustbins frequently.

Ask for independent information on alternative home pest solutions:  
[www.pan-uk.org/factsheets/](http://www.pan-uk.org/factsheets/);  
[www.panna.org/your-health/home-pets-garden#generalHouseholdAlternatives](http://www.panna.org/your-health/home-pets-garden#generalHouseholdAlternatives)

### JOIN OUR ACTION FOR A REAL POLICY

CHANGE IN THE EU NOW!

WHEN IT COMES TO CONSUMER PRODUCTS, USERS AND CONSUMERS MUST HAVE THE LAST SAY. TO HELP YOU DO SO, PAN EUROPE PREPARED SPECIAL COMMUNICATION TOOLS AND TIPS FOR CONSUMERS THAT ARE AVAILABLE ONLINE AT [WWW.DISRUPTINGFOOD.INFO](http://WWW.DISRUPTINGFOOD.INFO)

#### CHALLENGING THE «BIG ONES» IN COURT

When facing big industries or reluctant politicians, consumers and users can make the difference. The recent court trial against Monsanto in France is a perfect reminder of the power of the public. On February 13, 2012, the giant agrochemical was condemned by French Court for the intoxication of farmer Paul François who had been using its best-seller herbicide Lasso. For the very first time in France, the firm had to provide the farmer with full compensations for his loss. This Court case is a milestone. It proves that, from now on, companies will have to take the responsibility for their products upon themselves. This also paves the way for a stronger involvement of consumers and users against the abuses of agrochemical brands, starting with the creation of victims' associations, like Paul François' association «Phytovictimes<sup>1</sup>», in France.

*1. To find out more about this association and ways to get involved, go to: [www.phyto-victimes.fr/](http://www.phyto-victimes.fr/) (French) or watch the documentary « La mort est dans le pré », by Eric Guéret (French)*

#### COMMUNICATION TOOLS

Online, you will find ready-to-use communication tools to encourage policy change in the EU towards a stricter regulation of pesticides. These are tools that are used regularly by PAN Europe to lobby politicians and big companies.

**Together with  
PAN, you can spread  
the word for a world free  
from harmful chemicals  
and a brighter future  
for generations to  
come...**

We would like to thank all our partners, people and NGOs, who helped us write this guide. Special thanks to Les Paniers Verts and Elementerre, to all our volunteer translators, to our designer Krisztina and our webmaster René, and all the journalists who have supported our campaign. We would also like to thank the European environment and health Initiative (EEHI) for financial support.

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PAN Europe is a global network of environmental NGOs founded in 1982 that promotes a safe sustainable agriculture. PAN is active on 5 continents. We work closely with political and institutional representatives in order to reduce the use of pesticides and replace them with alternatives respectful of both consumers and the environment. Our campaigns aim to raise the awareness of the public and UE key decision makers on the dangers of pesticides and to change policy for the generations to come.

This consumer guide is an initiative by PAN Europe (Pesticide Action Network Europe). It was co-written with PAN members Global2000 and PAN Germany.

design and layout: Krisztina Mogyoró \* [www.envitrend.hu](http://www.envitrend.hu)