START IN LIFE –

Environmental influences on infants, unborn babies and fertility

Questions and Answers

Bundesamt für Strahlenschutz

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FOREWORD

Dear Readers,

Are you expecting a baby, or do you already have one? Congratulations! Not only are you and your family, but also our society is responsible for its children and ensuring that they can grow up healthily. Stable living conditions in Germany and a legally regulated health care system, together with preventive measures of health protection, form an essential foundation. Responsible individual decisions can also have a great influence on many areas of life.

We often wonder, however, into what sort of an environment our children are being born, and to what extent the environment has an effect on our lives, and especially the lives of our children. When we discuss the subject of "the environment" we mean, on the one hand, the social sphere, which should provide a general sense of security, and on the other hand, the environment in the real sense of the word with the influence of water, air and earth, which, under certain circumstances, can be detrimental to human health. Although environmental pollution affecting human health has decreased significantly in Germany due to legal regulations and agreements (like the Drinking Water Regulation), the question of whether the environment is "safe" for our children nowadays still arises.

Reports about climate change, contaminants in household products and in food, air pollution and a high level of high ultraviolet radiation give rise to the suspicion that the environment or our immediate surroundings has hidden dangers, some of which are yet to be discovered. To what extent can expectant or new parents influence the life of their unborn baby or infant (child before first birthday) in this respect? What is best for unborn babies and infants, and what must they and can they be protected from?

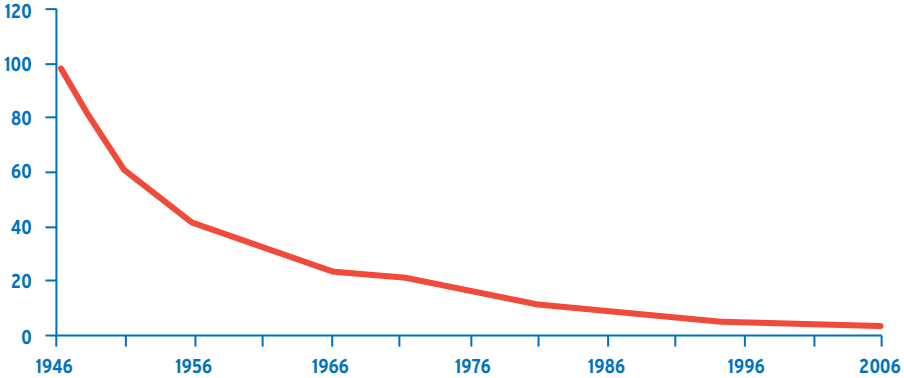
This informative brochure, which was produced within the framework of the German Action Programme Environment and Health (APUG), the Federal Ministry of the Environment, Nature Conservation and Reactor Safety (BMU), Federal Ministry of Health (BMG) and the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) attempts to answer these and similar questions for interested expectant and new parents. There is also helpful information for those who play a role in looking after and advising pregnant women and parents. At the same time, this brochure offers advice on how to avoid or minimise different risks. A doctor's advice should be sought in individual cases, and especially if medical questions arise.

The brochure is divided into three parts. The first part answers questions on the subject of unborn babies. The second part is concerned with infants. The third part of this information pamphlet deals with questions regarding links between fertility and environmental influences.

The Editors, April 2008

SO MUCH IS GOOD ...

The start in life: it could hardly be better. The infant mortality rate has steadily decreased and life expectancy increased in Germany and the rest of Western Europe during past years and decades.



The decrease in infant mortality: in 1946 of 1000 live births 99 babies died during the first year of life. In 2006 the figure had fallen to 3.8.

(Source: Federal Statistical Office)

Good quality food is readily available, medical care of the population is good and great emphasis is laid on environmental protection.

This means that children in Germany can expect a long and active life, with proper medical attention and stable living conditions. Unfortunately, this is not the case for all children all over the world.

... BUT SOME THINGS COULD BE EVEN BETTER.

In spite of these good conditions there are still problems which are yet to be solved, and new problems are constantly arising. Our living conditions have greatly improved, but our environment has become much more complex. While new technologies and changes in lifestyle are mostly advantageous to our health they are sometimes accompanied by new possible risks. The dangerous infectious illnesses, which used to be commonplace due to inadequate standards of hygiene, have now been replaced by chronic diseases and the question of whether these diseases could, at least partly, be caused by the environment.

Humans live in and with the environment. We are born into our surroundings and are part of them. We can influence and also be influenced by our environment. This happens constantly. Therefore all environmental influences are, somehow, “normal”. Environmental influences can be beneficial or harmful to humans, regardless of whether they are “natural” or a result of human interference.

Some substances and mixtures of substances which are present in the environment can be harmful to humans, but also to animals, plants and other organisms, and even to whole ecosystems (“pollutants”). Physical factors, like radiation and noise, are also environmental influences which can be detrimental to human health.

Biological influences can also be harmful to human health. Bacteria and viruses are well-known examples. Less known, however, is the fact that the spreading of viruses and bacteria is facilitated by factors caused by humans.

Social factors and specific living conditions also have an important influence on our health. Many links become apparent in connection with areas surrounding busy roads, for example, and passive smoking at home.

The intention of this brochure is to provide you with guidelines as regards environmental influence on human health and ability to reproduce, and to show how personal or social and political decisions can have a positive influence on the environment.

PART I

Effects of Environmental Influences on Unborn Babies

CAN ENVIRONMENTAL INFLUENCES OR POLLUTANTS AFFECT AN UNBORN BABY?

Pollutants which are absorbed by the mother can be harmful for an unborn baby, in some cases even when the harmful substances were present in the mother's body long before the beginning of pregnancy. Harmful substances (alcohol, carbon monoxide, substances present in cigarette smoke, like polycyclic aromatic hydrocarbons (PAHs)) can pass from mother to baby via the placenta.

Some substances which are important for environmental medicine, like lead and methyl mercury, which are known to be poisonous, can also pass into the baby's bloodstream. Substances stored in the mother's fatty tissue, like polychlorinated biphenyls (PCBs), for example, can also be passed on to the unborn child.

During the first few days after conception, when the first division cycles of the fertilised egg occur, the All or Nothing Principle prevails: considerable damage to the first cells of the new organism causes them to die.

The embryonic stage follows. This takes place during the first trimester of pregnancy. Due to rapid cell division and the development of tissue and organs during this stage any damage to the embryo is especially significant, and can, depending on the exact timing of the influence, lead to specific abnormalities.

The following six months of pregnancy until birth is known as the foetal stage. During this period obvious abnormalities are usually no longer caused, but losses or damage to organ substance or structure can occur. An example of this is foetal alcohol syndrome; a condition caused by alcohol misuse on the part of the mother during pregnancy, which affects growth, the central nervous system and can cause changes in facial features before and after birth.

Damage caused by pollutants is not always immediately obvious. If a foetus is harmed by specific harmful substances it can lead to some less serious conditions in later life, like behavioural problems or learning difficulties. This is the case with organic mercury or PCBs. Other pollutants, which affect the child before birth, damage the reproductive organs and thus lead to reduced fertility in later life.

Other harmful influences may occur through ionising radiation (radioactivity). The embryo or foetus can also be indirectly affected if the mother is exposed to harmful influences of this kind, including those caused by noise or heat, which are detrimental to her health.

On examination of the possible reasons for congenital abnormalities we notice that 65 to 75 per cent of all abnormalities have no obvious cause, 15 to 25 per cent are genetically inherited and 10 per cent can be attributed to harmful environmental influences (in a broader sense) of which less than 1 per cent were caused by medicines and ionising radiation. All other abnormalities can be attributed to the influence of alcohol, tobacco smoke, a bad diet, malnutrition and infections.

WHAT ARE THE EFFECTS OF TOBACCO SMOKE AND ALCOHOL DURING PREGNANCY?

It is proven that smokers absorb many substances, some of which are extremely poisonous, like nicotine, carbon monoxide, hydrocyanic acid and formaldehyde. Tobacco smoke also contains many carcinogenic substances like benzene and nitrosamine. These substances are absorbed by an unborn child and can harm it. Tobacco smoke also contains heavy metals and radioactive substances like polonium and radium. The exact effect of many of the substances contained in tobacco smoke is still unknown. Many of them belong to the group polycyclic aromatic hydrocarbons and are carcinogenic.

It is therefore advisable not to smoke, especially during pregnancy.

If a pregnant woman drinks alcohol it reaches the embryo via the placenta and attacks the developing organs and nerves. This can result in a low birth weight or even serious mental and physical disabilities, like heart defects or brain-development disorders. Every year around 2000 obviously alcohol-damaged children are born in Germany. How much alcohol a pregnant woman can safely drink without harming her child cannot be specified. Studies show that a child's growth and intelligence can be affected by amounts of alcohol that healthy women can quite safely drink when they are not pregnant. It is therefore advisable not to drink alcohol during pregnancy.

Non-smokers

- *greatly reduce the risk of miscarriage*
- *reduce the risk of a stillbirth by a third*
- *reduce the risk of a premature birth by half*
- *increase the likelihood of a normal birth weight*
- *increase the chance that the baby will have a normal head circumference*
- *reduce the probability that the child will suffer from allergies*
- *reduce the risk of Sudden Infant Death Syndrome*

The BZgA can help you to stop smoking: → note the informations in the chapter: Is tobacco smoke harmful to infants?

CAN POLLUTANTS RAISE THE RISK OF MISCARRIAGE?

Certain poisonous chemicals, including drugs, alcohol and nicotine, and radioactive radiation can result in miscarriage or serious damage to the unborn child. The individual limit can vary greatly and much depends on the "dose". The use of certain drugs usually puts an unborn baby at risk. A small sip of wine or a short drag of a cigarette probably does not endanger the life of an unborn child. As a precautionary measure it is generally advised not to take drugs, smoke or drink alcohol while pregnant.

WHAT ABOUT TAKING MEDICINES DURING PREGNANCY?

Medicines can also harm an unborn child. If an expectant mother develops an illness that requires treatment the medicine must be chosen carefully. In less severe cases it is sometimes possible to avoid taking medication, but in other cases it is in the interest of mother and child to treat the illness.

Medicines should only be taken during pregnancy if recommended by a doctor. Many health problems which occur during pregnancy can be treated with tried-and-tested medicines which pose only a minimal risk for the baby. There are often alternative methods of treatment which can replace medication.

Freely available over-the-counter medicines should not be taken without the consent of a doctor. This also applies to vitamins and natural preparations.

HOW CAN EXPECTANT MOTHERS ENSURE THAT THEIR DIET HAS NO DETRIMENTAL EFFECTS ON THEIR BABIES DUE TO CONTAMINANTS?

The best form of nutrition is a varied wholefood diet, and this is also the case during pregnancy.

Nutrients like protein, vitamins and minerals, especially iron and calcium are required in larger amounts during pregnancy. The daily required energy intake increases by 300 kcal per day, a comparably small amount, and should be provided by high-quality nutrient-rich food. A varied protein-rich low-fat diet can usually provide the extra dietary requirements of pregnant women.

A varied balanced diet is also advisable in view of the risk of food being contaminated by harmful substances. Most food examined in Germany is not contaminated to the extent that it should be cause for concern. Pesticide residues exceeding the authorised maximum amount are still found in some sorts of fruit and vegetables. The Federal Office of Consumer Protection and

A doctor should be consulted as regards the necessity of taking iron, iodine and calcium. Experts recommend taking folic acid from the time you start trying to conceive until the end of the fourth month of pregnancy. It is proven that this prevents problems in the development of the spinal cord (spina bifida, neural tube defects).

Information on the Internet

Assorted frequently asked questions and answers on folic acid:
www.bfr.bund.de/cd/9289

Food supplements:
www.bfr.bund.de/cd/10991

Food Safety (BVL) annually presents the "German National Report of Pesticide Residues", according to which 38 % of the examined specimens in 2006 contained no pesticide residues, 57 % had residues that did not exceed the legal limit and 5 % contained residues that did exceed the limit. In the last few years the fruits and vegetables that exceeded the maximum amount were rocket, peppers, aubergines, grapes, currants, courgettes, lamb's lettuce and peaches. But, it has to be pointed out that, although these values are over the legal limit they are not necessarily a cause for concern as regards human health.

It was found that the maximum levels were not exceeded in baby food. Basic foodstuffs, like potatoes and cereals, were only contaminated to an insignificant amount, and the legal limit was rarely exceeded. This was also the case for kiwis, apples, bananas, carrots, tomatoes and other sorts of food.

If the daily vitamin intake is reliant on certain fruits and vegetables, e.g. grapes, peppers and courgettes, organic produce is a good alternative as it is usually free from, or has very low levels of, harmful substances.

In 2006 it was found that organic produce was contaminated to a much lesser extent than all the other samples: 71 % showed no quantifiable residues and, although residues were found in 28 % these were in very small amounts and below the maximum level. Residues with contents above the legal limit were only found in five cases (0.5 % of samples).

The following tips can help to reduce the amount of harmful substances absorbed with food:

- *Always wash fruit and vegetables thoroughly. Peel them if possible.*
- *Only eat wild mushrooms occasionally.*
- *Only eat innards occasionally (especially those from wild animals).*
- *As linseeds have high cadmium content no more than 20g should be eaten daily.*

In order to cover increased iodine requirements the use of table salt containing iodine and eating fish twice a week is recommended. Some sorts of fish, however, especially larger and older predator fish, which are higher up in the food chain, like shark, white halibut, swordfish or tuna, often contain larger amounts of mercury. As mercury can affect the development of a child's brain, it is recommended that pregnant women and breast feeders eat these sorts of fish only in very small amounts. The sorts of fish most eaten in Germany, like coalfish, salmon, herring, trout and carp, do not belong to this category.

Certain infectious diseases, like listeriosis and toxoplasmosis, which are harmless for the mother but dangerous for the baby, can be prevented by not eating raw meat, raw fish, and non-pasteurised milk and its products. Fruit, vegetables and salad should always be washed thoroughly.

ORGANIC PRODUCTS

The consumption of organic produce is recommended as a precautionary measure for the following reasons:

Organic products are manufactured without the use of synthetic pesticides or synthetic fertilisers. Genetic engineering and food irradiation is not applied in the production of these products. Products with organic ingredients are manufactured without flavour enhancers, like sodium glutamate, and only natural flavourings are added.

All animals are kept in an as natural an environment as possible. The selection of robust breeds, a balanced diet and a suitable number of livestock are measures which help to prevent illness among animals.

Organic products are more expensive for the consumer than their non-organic counterparts as their cultivation, harvest, production, transportation and storage usually requires more attention. Consumers, however, can be assured that they are buying healthy tasty products with labelled content and origin, and that the animals were kept in an appropriate ecologically sound environment where cattle farming and plant cultivation occur in harmony, thus supporting the ideology of organic farming.

This is beneficial for the soil as a smaller area of land is required and chemical pesticides and fertilizers are unnecessary. This is especially environmentally friendly when consumers buy regional and seasonal produce, as the storage and transportation of these products are less detrimental to the environment.

Information on the Internet (in German)

Further information for parents on healthy eating habits for the whole family, both before and after pregnancy, can be ordered or downloaded from the website www.oekolandbau.de.

The direct link is:
www.oekolandbau.de/verbraucher/wissen/infopaket-bio-fuer-die-ganze-familie/ernaehrungskalender-fuer-eltern-teil-1/

Environmental protection is an important prerequisite in ensuring an environment in which it is worth living, especially for children. Thus, investing here is worthwhile.

IS IT HARMFUL TO THE BABY IF THE EXPECTANT MOTHER HAS AMALGAM FILLINGS?

Amalgam, which is used in fillings, is an alloy containing around 50 % mercury and an alloy powder, which, in addition to other metals, also contains small amounts of mercury.

Amalgam fillings and their effects on our health have been controversial for a long time. It is known that unborn babies are very sensitive to the damaging affects of mercury if the level of contamination is very high and the metal is present in its organic form (i.e. as methyl mercury). Amalgam fillings contain mercury, but in metallic not organic form.

The tiny amounts of non-organic mercury which are continuously emitted from hardened and intact fillings do not pose any health risks for unborn babies.

Whether mercury is released from amalgam fillings or not depends on their number and condition. Teeth grinding and the intensive chewing of gum increases the release of mercury. The risk of contamination is during the filling process and the removal of these fillings especially high. Therefore, it is not advisable to have an existing amalgam filling removed shortly before or during pregnancy. This does not, of course, apply in the case of treating a medical complaint.

The majority of any released mercury is absorbed as a metallic vapour in the lungs of an organism and transported by the blood. It can enter the unborn baby's bloodstream via the placenta.

At present, there is no scientific proof that a baby can be harmed by the mercury content of its mother's amalgam fillings. However, as a precautionary measure, it is advisable to subject an unborn baby to as little mercury as possible.

The Federal Institute for Drugs and Medical Devices (BfArM) recommends neither the filling of teeth with amalgam nor the removal of existing amalgam fillings for expectant mothers. If a tooth must be filled during pregnancy or when breastfeeding (e.g. in the treatment of toothache or replacement of a lost filling) alternative materials should be used, such as glass-ionomers or compomers. The extensive filling of teeth should only be carried out in the case of an emergency during pregnancy.

Information on the Internet (in German)

The updated version (2005) of the Federal Institute for Drugs and Medical Devices' (BfArM) brochure "Amalgame in der zahnärztlichen Therapie" can be downloaded from the website www.bfarm.de.

IS IT A GOOD IDEA TO MOVE HOUSE OR RENOVATE BEFORE THE BIRTH?

The birth of a baby leads, doubtlessly, to radical changes in the parents' lives. The birth of a baby also has a drastic effect on their home. Parents often consider moving before the birth of a child, or at least making some changes at home in preparation of the new arrival. There are usually plans to redecorate and furnish the nursery. New furniture is acquired and walls are decorated with child-friendly pictures. It must be borne in mind, however, that emissions from paints, varnishes or new furniture can be released and contaminate the air in the rooms in question, and can affect a child's health.

Babies spend as much time as adults indoors in our part of the world: 80 % to 90 % of the day. Unlike adults, however, babies rarely change rooms. They are also unable to move away from the source of pollution or to eliminate it. Parents often air rooms too little, out of fear that rooms could become draughty or too cold. This means that children's bedrooms often become stuffy.

It is not recommended to redecorate shortly before the birth of a baby. New items should emit as few harmful substances as possible and care should be taken to buy products marked with the "Blue Angel", or other labels which indicate a low level of harmful substances. If redecorating cannot be avoided the rooms must be aired thoroughly afterwards.

Apart from the strain put on the mother's body, which could affect her pregnancy, it should be considered that many chemicals, which the mother absorbs through her lungs, also reach the unborn baby. Therefore, any redecorating should be done with products containing a low level of harmful substances. The "Blue Angel" indicates products of this sort e.g. paints and varnishes.

Information on the Internet

A list of "Blue Angel" products can be obtained from the website www.blauer-engel.de/en/.

It may be necessary to buy some new furniture: a changing table, a cradle or an additional cupboard. If these items cannot be bought second hand, care should be taken that they affect the air as little as possible. New or second-hand items of furniture that smell strongly are unsuitable for babies and should be removed.

ARE ELECTROMAGNETIC FIELDS HARMFUL TO UNBORN BABIES?

Humans are subjected to electromagnetic fields (EMF) every day: the earth's magnetic field, low-frequency electric and magnetic fields of household electricity, for example, and high-frequency electromagnetic fields used in the transmission of radio and television programs.

Nowadays, humans are exposed to much more technically generated EMF than formerly as they are present in nearly all areas of life: in the environment, at work and in medical equipment. EMF can affect our health if their intensity is high enough. Intensities of this level are not usually reached by a long way in every-day life (e.g. mobile phones and high-voltage transmission lines). There are legal guidelines for the minimisation of the emissions of fields of this kind. The field intensities which are present in our environment are, on average, well below the legal limit. According to current scientific knowledge, there are no health risks if the legal limits are observed. This also applies to unborn babies.

Field strengths at some places of work can be much higher than in the environment. As the legal limit for employees who are exposed to high field strengths at work is higher, the case of each individual pregnant woman should be examined separately in the interest of the unborn baby.

HOW SAFE ARE ULTRASOUNDS?

During pregnancy various different appropriate medical examinations are carried out, including medically necessary ultrasonic scans. Due to the wave character of the ultrasonic waves, and their properties as they spread through tissue, they can cause the formation of cavities and heat production. There are no health risks for mother and baby if used correctly. As a precautionary measure, however, no medically unnecessary ultrasounds should be carried out. Ultrasonic films of the unborn baby should not be made by amateurs, as this exposes the baby to ultrasonic waves in uncontrolled intensities under uncontrolled conditions for long periods of time.

DOES IONISING RADIATION PRESENT ANY POSSIBLE HEALTH RISKS FOR NEWBORNS OR UNBORN BABIES?

Newborn and unborn babies are especially sensitive to ionising radiation (e.g. from x-rays or radioactive substances). The possibility of serious health problems arising in unborn babies depends on the timing and extent of the influence of radiation during pregnancy. The probability of abnormalities, mental disabilities or the child developing cancer in later life increases the higher the dose (normal x-ray examinations do not reach levels of this sort). Medical examinations involving ionising radiation are only allowed to be carried out on pregnant women if the doctor decides, after carefully weighing up the pros and cons, that such an examination is absolutely necessary. Women of childbearing age must always be asked before a planned medical examination involving ionising radiation if they could be pregnant. If there is any doubt a pregnancy should be assumed.

Information on the Internet

Frequently asked questions on x-ray diagnosis
www.bfs.de/en/ion/faq/faq_roentgen.html

How can you protect your unborn child?

- *Always inform your doctor that you are, or could be, pregnant.*
- *Demand that every x-ray examination is entered in your x-ray registration card and take, if possible, existing X-rays with you to planned examinations in order to avoid the same examinations being carried out twice.*
- *Ask your doctor to explain why such an examination is necessary and if there are any alternatives.*
- *If you are worried about exposing your unborn child to radiation, please consult your doctor, who can have the risk calculated.*

IS IT SAFE TO FLY WHEN PREGNANT?

For passengers and air-crew every flight involves a certain, though small, amount of radiation which is caused by cosmic radiation. This increases the nearer to the geomagnetic poles the flight path passes (e.g. pole routes to North America or Japan), with increasing altitude and length of flight. Travelling by air is, in principle, possible during pregnancy and is usually allowed. However, as ionising radiation can affect the development of unborn babies, especially during early pregnancy, every contact is better avoided. Occasional business trips or travelling on holiday by plane is considered harmless as such trips contribute only minimally to natural (e.g. cosmic) ra-

If you are pregnant and have a long-haul flight planned, or fly on a regular basis because of your job, please consult your doctor. It is possible, in some cases, to weigh up the pros and cons rationally.

diation. However, neither long-haul flights nor flying on a regular basis can be recommended during pregnancy.

The risk of thrombosis increases even more for pregnant women during long-haul flights, as their freedom of movement is greatly reduced. It is especially important for expectant mothers who have to fly long distances to drink enough fluids and to move around as much as possible. Travelling by train and the choice of a nearby holiday destination is recommended – and better for the environment.

Many airlines demand a medical certificate from pregnant women who wish to fly towards the end of pregnancy. The greatest risk is an unplanned delivery under unfavourable conditions. It is, therefore, strongly recommended not to fly during the last month of pregnancy.

PROTECTION AGAINST INFECTIONS THROUGH VACCINATION AND TAKING MEDICINES

Travellers visiting certain countries are recommended to protect themselves against illness through vaccination. It should be carefully considered whether a trip to a destination of this sort is completely necessary and justifiable for pregnant women who are not already immune to the relevant diseases. The pros and cons of all prophylactic vaccinations for travellers must be carefully considered in the case of expectant mothers. Vaccinations during pregnancy should be avoided if possible, and should only be carried out on the advice of a doctor.

Only a few of the available anti-malarial medicines can be taken during pregnancy. It is, therefore, not recommended to travel to malarial areas. Malaria is especially dangerous for mother and child during pregnancy. Expectant mothers who contract the disease for the first time, which is usually the case for European travellers, are often badly affected by the disease. If travelling to a malarial area is absolutely unavoidable, special care should be taken to avoid being bitten by mosquitoes like sleeping under mosquito nets and wearing suitable clothing. Insect repellents can be absorbed by the body through the skin. Some sprays and lotions are more suitable for use during pregnancy than others. It cannot be guaranteed, however, that insect repellents and anti-malarial medicines are safe to use during pregnancy. Their use should be carefully considered in each individual case. General recommendations for the use of such products cannot, therefore, be stated.

PART II

Infants and their Environment

IS BREAST MILK CONTAMINATED WITH HARMFUL SUBSTANCES?

Breast milk provides the best nourishment for new babies as it contains all the nutrients required for development: protein, lactose, unsaturated essential fatty acids, vitamins, minerals, enzymes and antibodies. Breastfeeding strengthens the bond between mother and baby and supports the child's emotional and social development.

Breast milk can contain harmful substances, such as caffeine, nicotine, alcohol to name a few. A mother can positively influence her milk's quality by leading a healthy lifestyle. The absorption of some substances from the environment, through food, for example, is unavoidable. Some of these substances are difficult to break down and fat-soluble. They are stored in fatty tissue, mobilised during the breastfeeding period and pass into the mother's milk. The breastfed baby ingests these harmful substances.

As some substances could pose a health risk for new babies, the level of environmental contamination in breast milk has been measured, to some extent, since the beginning of the eighties. These substances include organochloride compounds, like DDT[1], which was used in agriculture many years ago, polychlorinated biphenyls[2] (PCB), which were used in technology and dioxins, which are often unwanted by-products of combustion reactions. Legal regulations and technical measures, like production and application bans and emission limits, have since been established, which has reduced the content of organochloride compounds in breast milk by between 60 and 90 per cent during the last 15 to 20 years.

There are, however, "newer" foreign substances in breast milk. These include synthetic musk compounds[3], which are used to perfume cosmetics and detergents, and certain flame retardants, the polybrominated diphenyl ethers,

[1] Dichlorodiphenyltrichloroethane: an insecticide which has been banned in the Federal Republic of Germany since 1972 and in the new Federal States since 1989. Its use in controlling malaria is only allowed in a few countries today, as it is one of the few effective methods of doing so. Efforts are being made to use this substance specifically in malarial areas in the future, in the context of combating malaria.

[2] Polychlorinated biphenyls: these compounds have been banned in open use since 1978 and in general since 1989. They were used in various technical appliances and components, and in certain building materials.

[3] German manufacturers stopped using certain dubious musk compounds more than 10 years ago, but less harmful musk compounds also turn up in breast milk.

which can be found in synthetic materials used in the production of televisions, computers and car seats, for example.

The use of these substances in so many popular products together with ever-improving analytic methods has lead to the detection of such chemicals in breast milk. Thus, we must be aware that more "new" substances will probably be detected in the future.

The level of these substances found in breast milk is the decisive factor as to the extent of the health risk for a new baby. Paracelsus, the famous medical scholar of the late middle-ages said, "The dose makes the poison."

The levels of the stated compounds in breast milk are known. They are present in very low levels, i.e. in the trace and ultra-trace regions. For the sum of all dioxins, average contents of around 10 nanogram/kilogram of milk fat were found, i.e. a billionth of a gram in 3 litres of breast milk. Levels this low can only be measured with the most modern and sensitive analysis technologies. For DDT and PCB the average contents were found in levels of around 100 and 300 microgram/kilogram of milk fat respectively, i.e. 10 or 30 millionths of a gram in 3 litres of breast milk. The levels of these substances, which have been examined for many years, continue to decrease.

The fact that substances like DDT and PCB are still found in breast milk and in the blood of breastfed children in higher concentrations than in bottle fed children, although they have been banned for such a long time, shows how important it is to detect the presence of harmful compounds in the environment, in food and in human samples, like breast milk, for example.

In the last few years different expert committees, like the National Breastfeeding Commission and the WHO, have looked into the matter of foreign substances in mother's milk. Using the measured levels, they have estimated to what extent a baby absorbs harmful substances from its mother's milk and assessed whether these amounts could present health risks for the baby. As a result, all of these committees have independently recommended breastfeeding as, according to present findings, there are no recognisable threats to a child's health due to breastfeeding, but there are numerous advantages. The National Breastfeeding Commission recommends exclusive breastfeeding until the baby is six months old. There are also no obvious health risks in breastfeeding a child, in addition to feeding solid food, after the first six months. Therefore, the National Breastfeeding Commission recommends breastfeeding for as long as mother and child are happy with the situation.

However, foreign substances in breast milk are unwanted. The expert committees also stress this point. For this reason they demand further measures to reduce the release of such substances into the environment and hereby decrease levels in breast milk.

The levels of the various foreign substances found in breast milk are usually measured by the Chemical Investigation Institutes of the German states and local authorities free of charge. Parents who would like a milk sample to be examined should inform their local health authority.

For further information on breastfeeding please refer to the BZgA's brochure, "Breastfeeding and Breast Milk". It is available free of charge upon request.

Information on the Internet (in German)

The brochure "Stillen und Muttermilchernährung" (Breastfeeding and Breast Milk) can be downloaded from the website www.bzga.de.

Further useful information and addresses can be obtained on the website www.stillen-info.de.

ARE THERE RADIOACTIVE SUBSTANCES IN BREAST MILK?

If a mother absorbs radioactive substances during the breastfeeding months, or has absorbed them earlier in life, they can end up in her milk. Radioactive substances can unintentionally enter the mother's body through the air that she breathes or food, but also through medical administration.

Natural radioactive substances are present in all food. They are a natural part of life. Even synthetic radioactive substances, e.g. those present in the environment as a consequence of the reactor accident in Tschernobyl, are no cause for concern: home agricultural products are now only very slightly contaminated. Game and wild mushrooms from southern Germany and some areas of Europe can, however, even 20 years after the accident, still contain high levels of caesium-137. These foods should, therefore, only be eaten in small amounts. Furthermore, heavy metals like lead, cadmium and mercury accumulate in some sorts of mushrooms. These heavy metals can also be detected in breast milk.

Much larger amounts of radioactive substances are administered to female patients for medical reasons, during the diagnosis or treatment of different diseases. A considerable amount of the radioactive substances can pass into the mother's milk in these cases. For example, about half the amount of the radioactive iodine used in the diagnosis and treatment of thyroid problems ends up in the mother's milk. According to the Radiation Protection Ordinance, it is the doctor's duty to ask women of child-bearing age whether they are pregnant or breastfeeding before administering treatment. Should the need arise, ask your doctor if you can continue to breastfeed. It is often necessary to stop breastfeeding, or at least to take a break, so that the baby is not unnecessarily exposed to radiation.

Some mothers come into contact with radioactive substances at work. If the mother is pregnant or breastfeeding, it is important that the employer is informed as soon as possible. According to the Radiation Protection Ordinance the employer is obliged to organise working conditions in such a way that ensures no radioactive substances can be absorbed. Thus, radioactive substances cannot pass into the mother's milk regardless of her occupation.

As a precautionary measure mothers should generally ensure that they are exposed to as few radioactive and other harmful substances as possible – not only to protect herself, but also her breastfed child.

Information on the Internet (in German)

Radon in buildings:
www.bfs.de/ion/radon/radon_in_haeusern

Information about radioactive Substances in Food:
www.bfs.de/ion/nahrungsmittel/
(natural radionuclide)

and

www.bfs.de/bfs/druck/strahlenthemen/STTH_Lebensmittel.html
(reactor accident in Tschernobyl).

BREASTFEEDING AND ALCOHOL?

When breastfeeding it is best to be cautious with alcohol. Alcohol passes into the mother's milk and the milk then has almost the same alcohol content as the mother's blood and tissue. In a baby's body alcohol is metabolised more slowly than in the body of an adult. The development of organs and the brain are not yet complete, meaning that amounts of alcohol in concentrations which would be harmless for an adult could be harmful for a baby. Therefore, until more is known it is better to be cautious. However, if you want to drink a glass of wine or champagne while breastfeeding, in celebration of the baby's arrival or on other occasions, this is possible, but high percentage alcoholic drinks should be avoided.

IS BABY FOOD SAFE?

The Diet Ordinance in Germany stipulates not only the highest microbial safety, for example, but also the lowest possible levels of pesticides and nitrate in baby food.

There is a general limit of 0.01 mg per kg for residues of pesticides, insecticides and preservatives, and 250 mg per kg for nitrate in food. For some substances the stricter European guidelines for “Cereals and other solids for babies and toddlers” and “Infant formulae and follow-on formulae” apply since June 2004. The manufacturer is responsible for the observance of these limits and is subjected to spot checks, which are carried out by the official food quality controllers of the relevant German federal state. Additionally, the Federal Office for Consumer Protection and Food Safety carries out “food monitoring” which involves, on the one hand, the examination of a typical shopping basket which is put together according to the eating habits of the population, and on the other hand, current problems being dealt with in separate projects.

Good news: contamination low

The results of the Federal Office for Consumer Protection and Food Safety’s food quality control from 1995 to 2002 show that the contamination of food with unwanted substances is relatively low, with few exceptions. Baby food, for which especially strict regulations apply, was mostly free from pesticides and other unwanted substances. The contamination of wholegrain and mixed grain products for babies and toddlers with deoxynivalenol (a mycotoxin) was also low, according to tests carried out in 2003. Even the new even lower limits, which have been valid since 2004, were not exceeded.

The raw materials used in the manufacture of baby food in jars are subject to strict specifications. For example, the use of certain pesticides is not allowed. Baby food is subject to regular controls, also with regard to its nitrate content, which is not the case if the individual ingredients are bought separately. Those who wish to prepare baby food themselves should be sure to use organically grown products and certain vegetables like spinach, fennel, mangold and kohlrabi, which accumulate nitrate, only in moderation. Parents who prepare baby food themselves have the advantage of being able to select the ingredients themselves, which means they can cut out salt and sugar and other unnecessary ingredients. Children can also be offered a greater variety of flavours if food is prepared by the parents. When buying pre-prepared products be sure to check the list of ingredients. It should be similar to the recipe if you were cooking the dish yourself, and should not contain any unnecessary spices or flavourings, chocolate, cocoa, or food that could trigger an allergy, like eggs, milk, tomatoes, celery or nuts. Babies have a very sensitive sense of taste which should not be over stimulated, and it is important to avoid food which could trigger an allergy. The list of ingredients printed on the product lists the products in descending order of con-

tent. If your child suffers from a food intolerance, e.g. a milk allergy, you can quickly check if the product is suitable or not. The products should be given to your child when it has reached the age stated in your nutrition plan, and not as stated on the packaging. More information as regards preparing the right sort of food for your child through the different stages of its development is available in the brochure, "Nutrition Plan for Parents".

Information on the Internet (in German)

The nutrition plan for parents can be ordered or downloaded from the website: www.oekolandbau.de.

The direct link is: www.oekolandbau.de/verbraucher/wissen/infopaket-bio-fuer-die-ganze-familie/ernaehrungskalender-fuer-eltern-teil-1/ (Date of research: 23.07.2008)

Nutrition plan for the first year of life from the Research Institute of Child Nutrition in Dortmund: http://www.fke-do.de/ under Wissenswertes/Säuglingsernährung

Are there harmful substances in jar lids?

Since semicarbazide (SEM) was found in various products with glass packaging, especially in baby food, it has been discussed whether the sealing on the lid could be the source. According to new findings, SEM, which was found to cause cancer in animal tests, can be produced as a break-down product from the propellant azodicarbonamide. The use of this propellant, which is used to foam up the sealing compound in the metal lids, has been banned for this purpose since August 2005, even though the risk was estimated to be very low.

Natural honey can be dangerous for babies

Natural honey is a known source of infant botulism, an illness which can lead to a life-threatening respiratory paralysis. It is caused by the poisonous substances in the bacterium Clostridium botulinum, whose spores are very widespread in the environment (in dust and soil, for example). Bees come into contact with these spores in the course of their activities, and take them back to their hive along with the pollen and nectar. As honey is a natural and not heat-treated product, spores could enter the baby's intestines

where they would then germinate, leading to bacterial growth and the release of toxic substances. These spores present no danger for older children or adults who eat honey, as opposed to babies, as their well-developed intestinal flora hinder the growth of botulism bacteria.

Are there radioactive substances in baby food?

Radioactive substances are present in all food, even baby food (jars), in very small amounts. They are a natural part of life. Not even the synthetic radioactive substances, for example, those released into the environment after the accident in Tschernobyl, are grounds for concern. Agricultural home products are now only very slightly contaminated. In order to protect babies and toddlers the European Union set a limit of 370 Becquerel radiocaesium per kg (Bq/kg). Measured amounts in Germany constantly fall well short of this limit. Measurements of a few Bq/kg and less are typical.

Further information on feeding your baby is available in the brochure “Das Baby” (Babies), published by the BZgA.

Information on the Internet (in German)

www.bfs.de/ion/nahrungsmittel/
(natural radionuclides)

and

www.bfs.de/bfs/druck/strahlenthemen/STTH_Lebensmittel.html
(reactor accident in Tschernobyl).

HOW SHOULD BABY FOOD BE PREPARED?

Should tap water or bottled water be used?

Drinking water is one of the best tested and least contaminated foodstuffs in Germany, thanks to the Drinking Water Ordinance and its strict regulations. This is not only the case as regards chemical content and microbial pollution, but also as regards the maximum content of radioactive substances.

Tap water can be used quite safely in the preparation of baby food, baby teas or simply as a drink for older babies. Tap water is usually also suitable for use in the preparation of babies' bottles.

There are even nowadays, however, isolated cases in which lead pipes or fittings cause increased amounts of lead to be measured in water, which can be detrimental to children's health (lead affects the nervous system, amongst other things). Increased levels of copper are also detected in very acidic water (pH < 7.0)[1] if new copper pipes are in use, which also causes problems for babies (copper can damage babies' liver).

As a rule, only water fresh form the tap should be used, regardless of whether it is for babies, older children or adults. Turn the tap on and let the water run (this water can be collected and used for watering the plants or cleaning, for example) until it has a constant cool temperature. Suitable bottled water should be used for children, however, if the water pipes contain lead.

There are other cases where the local health authorities recommend the use of bottled water in the preparation of baby food: for example, in areas where high levels of nitrate are found in the water due to intensive agricultural use of the land. Levels should not exceed 50 mg of nitrate per litre of tap water. Levels of this kind are only usually measured if the water comes from a private well. High nitrate levels can be dangerous for babies as they attack the haemoglobin in the blood, thus hindering oxygen transport.

[1] Pure copper pipes are only suitable for use with non-acidic drinking water of pH ≥ 7.4 (in some cases even if the pH is lower, depending on the organic carbon content). Ask your water company if your drinking water is suitable. Water from private wells is often acidic and is usually untreated. If the water from a private well is intended to be used as drinking water it should first be checked whether the use of copper pipes is appropriate.

The following applies when selecting a suitable brand of bottled water:

According to the Mineral and Table Water Regulation "natural mineral water" should not contain any unnatural impurities or added substances. Higher concentrations of unwanted – even radioactive – substances are allowed. Therefore, when preparing baby food, use only bottled water labelled "suitable for use in the preparation of baby food". Bottled water of this special quality is only allowed to contain very low amounts of nitrate, sodium, sulphate, manganese, arsenic, uranium, and radioactive substances (radium-226 and radium-228).

If you have any questions regarding the quality of your drinking water supply, please consult your Water Company or local health authority.

Your landlord or the house owner should be able to tell you whether lead pipes are installed in your home, For further information, please refer to the brochure, "Blei und Trinkwasser" (Lead and Drinking Water). It is available free of charge from the Federal Ministry of Health (BMG). We also recommend the Federal Environment Agency's manual: "Trink was – Trinkwasser aus dem Hahn. Gesundheitliche Aspekte der Trinkwasser Installation." It is available free of charge from the Federal Environment Agency.

Further information as regards the radioactive content of drinking and mineral water can be found on the Federal Office for Radiation Protection's website.

Information on the Internet (in German)

"Blei und Trinkwasser" (Lead and Drinking Water):
www.kinderwelt.org/dateien/blei_und_wasser.pdf

"Trink was – Trinkwasser aus dem Hahn. Gesundheitliche Aspekte der Trinkwasser-Installation" (Health aspects as regards tap water):
www.umweltdaten.de/publikationen/fpdf-l/3058.pdf

Radioaktivitätsgehalt von Trink- und Mineralwässern in Deutschland:
www.bfs.de/ion/nahrungsmittel/

Baby food in the microwave – what should be taken into consideration?

Microwave ovens warm meals up quickly using high-frequency electromagnetic fields. It is often asked whether radiation can escape from appliances when they are in use and whether heating food in a microwave can lead to changes in the food which are detrimental to our health.

Numerous investigations of microwave ovens have shown that the average level of radiation leakage on the surface of appliances is around 1 % of the legal limit and that there are no health risks, not even for those especially in need of protection like expectant mothers and toddlers, when the appliance is in good working order.

There is often some concern that the structure of food is influenced differently when it is heated in a microwave as opposed to by means of more conventional methods like on the stove or fire, and that this could be detrimental to the nutritional value of the food. Correct is that whenever food is heated structural change is caused, regardless of whether a microwave or a more traditional method is used. The physical properties of microwaves can lead to meals being irregularly heated, overheated or not being heated up thoroughly enough to ensure the destruction of germs. This can be avoided if the special cooking instructions for microwaves are observed.

- *Microwave ovens which show signs of wear and tear, like obvious mechanical damage to the door, for example, should not be used. In this case, an inspection is necessary and should be carried out by customer services. Faults should be repaired or the defective appliance replaced.*
- *Even if the appliance is in good working order it is recommended that children are not directly in front of or next to the microwave when it is in use, so that they are not unnecessarily exposed.*
- *Be careful when heating baby food in the microwave: the food gets hot in the middle first. The food or milk could be heated irregularly or even become too hot, which could lead to the child being burned or scalded. The temperature of the food or milk should always be tested carefully before it is given to a child.*

Cooking on an induction hob – is it safe?

If an induction hob is used properly only a small leakage field (in this case varying magnetic fields) is to be expected. If unsuitable pans are used (non-ferromagnetic material, uneven base, too small for the hob) – or even if suitable pans are used, which are not placed centrally on the hob – distinctly higher magnetic fields can occur around the hob.

In this case, magnetic flux densities, which almost reach, or even exceed, the limit for the relevant frequency range as recommended by the International Commission on Non-Ionising Radiation Protection (ICNIRP), could be measured within normal working distance from the hob (10–20 cm).

If induction hobs are used properly, however, this does not usually occur. Therefore, the observance of the manufacturer's operating instructions is recommended.

BISPHENOL A IN INFANT FEEDING BOTTLES – CAUSE FOR CONCERN?

Bisphenol A[1] is a chemical component of the robust synthetic material polycarbonate, which is used in the manufacture of infant feeding bottles and plastic dishes. This chemical is also used in the coating on the inside of food tins. Bisphenol A can be released from these products in very small amounts, and pass into food.

The Federal Institute for Risk Assessment (BfR) is responsible for evaluating the extent of risks in connection with products. The BfR hereby leans on a re-assessment of bisphenol A, which was carried out by the European Food Safety Authority (EFSA) in 2007. This occurred especially in view of the detrimental effects observed in the descendants of laboratory animals.

Bisphenol A is neither acutely poisonous nor is there any indication of a carcinogenic effect. More recent tests on animals report, however, that the smallest amounts of bisphenol A can have an effect similar to that of the hormone oestrogen. Consequently, bisphenol A has been re-assessed in terms of health risk by means of a long-term study, which included the examination of the effects of low doses. On the basis of this study a Tolerable Daily Intake (TDI: 0.05 mg per kg body weight) was determined. It was also taken into consideration that in the human body bisphenol A is quickly converted into a metabolite, which does not have an effect similar to that of oestrogen, and is rapidly excreted via the kidneys. In this respect, according to recent information, humans are significantly different from rodents, who excrete bisphenol A much more slowly.

After careful scientific assessment of all studies that have been carried out so far, especially those concerned with low amounts of bisphenol A, both the EFSA and the BfR came to the conclusion that the normal use of infant feeding bottles made of polycarbonate does not represent a health risk for babies and toddlers due to bisphenol A. This assessment is based on the assumption that the estimated daily intake of bisphenol A for children is around 0.013 mg/kg body weight (a conservative assumption[2]). This figure is considerably lower than the tolerable daily intake which was deduced

[1] 2,2-bis(4-hydroxyphenyl)propane

[2] A conservative assumption is an assumption based on unfavourable prerequisites in the interest of safety.

from toxicological studies and includes safety factors (see above). The EFSA, the American Food and Drug Administration (FDA) and the Japanese health authority share this view.

Parents who still want to avoid the use of polycarbonate feeding bottles have the possibility of using glass feeding bottles. Bottles made of polyether sulfone are also available and are advertised as being "B free". Polyether sulfone has not been toxicologically examined to the same extent as bisphenol A, however.

Information on the Internet

Assorted questions as regards bisphenol A in infant feeding bottles are answered on the website:
www.bfr.bund.de/cd/7294

IS TOBACCO SMOKE HARMFUL TO INFANTS?

Smoking and breastfeeding

The following observations were made in breast feeders who smoked:

- *Milk production*

Smoking changes the mother's hormones which are responsible for milk production in the breasts. Mothers who are heavy smokers experience a delayed let-down reflex and they also produce less milk. There is an obvious link between the number of cigarettes smoked and milk production, i.e. the more cigarettes the mother smokes, the greater the effects on her milk.

- *Motivation to breastfeed and duration*

Results of all relevant studies show that smoking negatively influences the mother's willingness to breastfeed and how long a baby is breastfed. Comparative studies showed that non-smoking mothers were much more highly motivated than breast feeders who smoked, regardless of social status.

- *Changes in mother's milk*

It has been proved that many of the numerous substances, which are present in cigarettes, pass into the mother's milk, where they are found in the same concentrations as in the mother's blood. Some substances in cigarettes, like nicotine, for example, even exceed the blood levels. Carcinogenic substances which are present in cigarettes, like dioxins, benzopyrenes, nitrosamines and heavy metals, also pass into the mother's milk. The existing concentrations of these substances, which are released from fatty tissue and end up in the mother's milk as a result of active or passive smoking or exposure to industrial pollution during pregnancy, are thus increased. The concentrations of some substances in the milk can be influenced by refraining from smoking before breastfeeding. The concentration of nicotine in breast milk, for example, decreases dramatically within one hour of not smoking. This does not apply to all toxic substances.

- *Effects on children*

To what extent an infant is affected by substances in breast milk essentially depends on their concentrations and the absorption of the substances in its intestines. As the absorption rate of harmful substances in human intestines cannot be determined, little is known on the subject. The extent to which carcinogenic substances influence the frequency of cancer in later life can also only be speculated, as investigations of this sort are naturally difficult to carry out.

If a nursing mother smokes heavily the following can be observed in her child: reduced ability to feed, restlessness, colic, sickness and reduced weight gain. Illnesses involving the respiratory tract and the lungs (coughs, colds, croup, for example) are more common in children whose mothers smoked while breastfeeding.

These negative effects can probably not only be attributed to the absorption of harmful substances via breast milk but also to passive smoking, which occurs when a mother smokes around her child.

Effects of passive smoking

Only a small fraction – around a quarter – of the whole amount of smoke produced by a cigarette is inhaled. The majority of the smoke spreads from the cigarette into the air. Passive smoking is the term used to describe the breathing in of this air. The air breathed when smoking passively contains, to some extent, even higher concentrations of poisonous substances than the smoke inhaled directly from the cigarette. This can have severe consequences, especially for infants and young children as their organisms react especially sensitively to these poisons.

Children whose parents do not expose them to passive smoking are less likely to suffer from:

- *acute respiratory diseases*
- *bronchitis and pneumonia*
- *chronic coughs*
- *frequent middle-ear infections*
- *reduced lung function*
- *asthma*
- *allergies*
- *irritations of the eyes, nose and throat*
- *colics*

There is also a connection between sudden infant death syndrome and smoking. It can be assumed that not subjecting infants to passive smoking reduces the number of deaths. The mother is not solely responsible. Everybody, especially partners but also friends and acquaintances, should contribute to smoke-free air.

1. *It is highly recommended that mothers do not smoke during the months when they are breastfeeding.*
2. *Nursing mothers, who are unable to stop smoking completely, should smoke as few cigarettes as possible. Heavy smoking leads to problems when breastfeeding and in the child's development.*
3. *Nobody should smoke around your child in view of the possibility of the passive absorption of certain components in smoke.*
4. *Mothers can reduce the level of milk contamination by not smoking before feeding. The concentration of nicotine in breast milk, for example, decreases dramatically within one hour of not smoking.*

The BZgA can help you to stop smoking

- Help and advice is available via telephone hotline. Call **01805 313131** (all calls are charged according to your telephone company's prices).
- A START package is available to help you to stop smoking. It contains an extensive self-help programme and numerous informative brochures.

Information on the Internet (in German)

Stopping smoking with the BZgA
http://www.rauchfrei-info.de/

The START package can be ordered free of charge from the following address: Bundeszentrale für gesundheitliche Aufklärung, 51101 Köln, Fax: 0221-8992257, E-mail: order@bzga.de

No smoking in the car!

Smoke contains many harmful substances which occur in especially high concentrations when somebody smokes in a confined space e.g. in the car. Declare your car a smoke-free zone. When travelling long distances by car and smoking cannot be avoided take a break and smoke outside the car.

CAN ALLERGIES BE CAUSED BY ENVIRONMENTAL FACTORS?

Allergies are excessive defensive reactions of the immune system to certain, normally harmless, environmental substances (allergens), to which the human body reacts with symptoms of inflammation and by producing antibodies. They can become apparent, after previous sensitization, in the form of food allergies, hay fever, atopic eczema (neurodermatitis) and allergic asthma.

Allergic and asthmatic illnesses have become increasingly common in Europe during the past few decades. Investigations into the exact reasons for the development of allergies have not yet been completed. Discussed theories include the effects of hereditary influences and exaggerated hygiene. The latter could lead to an underdevelopment of the immune system due to a lack of contact to every-day foreign substances. The "hygiene theory" is based on the observation that children who grow up in rural areas and come into contact with farm animals seldom develop symptoms of allergies. This also applies to children who come from large families and only children, who visit child care facilities from an early age.

Allergy prevention is possible!

General recommendations include:

- *No solid food for babies until they are 5 months old.*
- *Avoid tobacco smoke – during pregnancy, too.*
- *Avoid temperatures indoors which promote the growth of mould (see the Federal Environment Agency's brochure, "Help! Mould at Home!"). Air rooms regularly, do not place furniture against cold outside walls and watch out for signs of dampness in rooms.*

If there are already cases of allergies or atopic illnesses like hay fever, allergic asthma or neurodermatitis in your family the following additional recommendations should be observed:

- *Do not keep pets with fur (rabbits etc.).*
- *Avoid keeping cats.*
- *Reduce the contamination level of house dust mites. This can be achieved by using a special mite-proof mattress cover (encasing) and washing bedding, pillows, covers and cuddly toys regularly at 60° C.*

Allergies and asthma are often linked to environmental influences. Discussed factors include the intensifying effects of long-term contamination caused by air pollutants like tobacco smoke and traffic emissions, especially diesel particulate.

Current studies show that smog not only worsens existing cases of asthma in children, but it also plays a role in its development, especially in connection with increased ozone levels. There is also some evidence that certain pollutants of indoor air (for example nitric oxides released during the use of gas hobs and some volatile organic compounds) can increase the risk of developing an allergy. The state of the immune system and contact to allergens play a much more important role, however, in the development of allergies. An early sensitisation to mites or cat hair allergens occurs where in-

creased contact to these allergens is unavoidable. High concentrations of mites in the home, for example, increase the risk of developing asthma symptoms and allergic asthma for children, who come from families with a history of allergies. Tobacco smoke significantly adds to this effect. The risk of developing asthma increases by 30 % if children are subjected to passive smoking at home.

However, a link between taking antibiotics and allergies has not been proven.

COSMETIC PRODUCTS FOR BABIES – IS LESS MORE?

If we consider that a few generations ago babies used to get by without any cosmetic products, like special baby shampoos, talcum powder or moisturisers, and that there are parts of the world where this is still the case, we realise that these products are rarely really necessary.

Care should be taken, when choosing items of this kind, that they contain no poisonous substances or substances which could trigger an allergy, like certain perfumes or preservatives. Perfumes are especially unnecessary in products for babies and should be avoided. Some of them are common allergens, and are chemicals which simply do not belong in products for infants.

These substances can be absorbed by infants' organisms, either via the skin or respiration.

Even though it can be assumed that most products which are manufactured especially for babies can be used safely, it is best to use them only when absolutely necessary.

There are certain skin complaints which need to be treated with a cream, like neurodermatitis or nappy rash. In such cases a doctor or midwife should be consulted.

Organic cosmetic products for babies also enjoy a good reputation: they are supposedly harmless and therefore superior to other products. It should be borne in mind, however, that not everything that appears to be

“natural” is, in fact, safe to use. It is often the case that the composition of these particular products is unclear or that the allergen content is especially high. “Plant-based” and “biodynamic” products should also be treated with caution.

ARE CHILDREN'S TOYS SAFE?

Infants stick toys in their mouths, bite around on them and hold them to their ears. This behaviour exposes them intensively to the substances their toys contain and also the noises they make. Critical substances should, therefore, be minimised as far as possible in line with the "Good Manufacturing Practice". Substances which are detrimental to human health do not belong in children's toys, if children can ingest them in alarming amounts.

It is imperative that children's toys are saliva and perspiration proof, i.e. the paint should not come off the toy in the baby's mouth.

There is a European Standard for toys (DIN EN 71 "Toy Safety"). This stipulates the chemical, mechanical and physical requirements regarding toys and their inflammability. Toys which comply with the standard are labelled with the CE mark; only toys labelled thus are allowed to be sold in the EU, and therefore in Germany, regardless of whether they are imported or home products. This gives no guarantees, however, as regards the chemical

composition of toys. In the DIN-Norm EN 71-3 “Toy Safety Part 3: Migration of Certain Elements” limits were set for the extraction of various elements (including heavy metals) out of materials used in the manufacture of toys. Other substances have not yet been included in this guideline.

Toys, like all products, contain many chemical substances. Depending on the strength of the bonds within the product and the extent of wear and tear the product has taken, tiny, or even larger, amounts of these substances can be released and ingested by children while they are playing.

An important group of substances which has been increasingly discussed in the past few years are phthalate-based softening agents for plastic; they do not form a strong chemical bond with plastics and are therefore easily released from children’s toys, where they can often be found in concentrations of up to 40 %. Phthalates only cause acute health problems in humans when they are present in high concentrations, but, in the long term, they can damage the kidneys, liver and eyes. They have an effect similar to that of hormones and can affect the development of the reproductive organs. The EU has graded softening agents such as DEHP, DBP and BBP as a threat to reproduction.

The use of these three softening agents has been banned in the manufacture of children’s toys since autumn 2006, due to a more recent European directive. The content of three further softening agents (DINP, DIDP and DNOP) is also no longer allowed in toys which toddlers put in their mouths.

Which toys are suitable for an infant to put in its mouth and chew on? This question cannot be thoroughly answered. Infants should only be given toys which the manufacturer declares to be suitable for this age group. Only then we can be sure that the risk is minimal. Toys with very small parts, which could be swallowed by an infant, or sharp edges are obviously not suitable for babies and toddlers. Unsuitable toys are labelled, “Not suitable for children under x years of age.” An increased content of softening agents must be assumed as regards older soft plastic toys.

If unsuitable plastic toys are swallowed, either whole or in pieces, the material could harden and change shape in the gastrointestinal tract, thus forming sharp edges which could be harmful to a child’s health.

HOW CAN INFANTS BE PROTECTED FROM NOISE POLLUTION?

Infants cannot move away from noise. Their parents decide everything for them: the position of the nursery, various activities; even their toys are given to them by adults. Infants are not yet able to put their hands over their ears when it gets too loud.

Children's ears are very sensitive to high sound intensities. Both single high-pitched sounds and chronic exposure to noise can have an effect on a child's hearing ability. Permanent hearing loss in a frequency range which is important for communication as well as tinnitus are typical forms of hearing defects, which are caused by noise pollution, and these conditions can occur as early as during adolescence. Hearing defects of this kind cannot be cured and can even become worse if individuals are also exposed to noise pollution during adulthood.

It is not yet clear whether infants are more susceptible to the effects of noise pollution than adults. Noise tends not to wake a sleeping baby, but this is not the case for older children.

There is a certain degree of ignorance as regards volume and the effects on a child's hearing ability, which means that children are often exposed to noise pollution. Improper use of loud toys also plays a role. If toys, like rattles or squeaking ducks, are held directly to a child's ear they produce noise which, at such a close distance, is comparable in volume to that of a jet or a rock concert. It is recommended that noisy toys of this kind are not given to children. The European Standard (DIN EN 71 "Toy Safety, Part 1: Mechanical and Acoustic Properties") which was discussed in the chapter, "Are children's toys safe?" also stipulates limits for noise emissions from children's toys with the CE mark. Improper use of toys through individuals can still lead to children's ears being overexposed. As a precautionary measure it is best not to give noisy toys to your child.

It is easy to test loud toys: simply hold them against your ear and try them out. In this way it is easy to distinguish between noisier and quieter products. You will find some products unpleasantly loud, even to the extent that they hurt your ears.

Babies and toddlers sometimes accompany their parents to rock concerts and parties. The sight of young children on the shoulders of their dancing fathers in the front row of a rock concert or party may seem to be good fun, but it can damage a child's sense of hearing.

For this reason loud music and events like rock concerts, street parties or trips to the cinema should be avoided. Fire-work displays (e.g. on New Year's Eve or Guy Fawkes Night) are also unsuitable for babies and toddlers, unless they occur under carefully controlled conditions. Improper use of fire works can lead to permanent hearing defects. This also applies to adults.

Studies carried out on adults show what long-term health effects noise pollution at home can have on the cardiovascular system. It is feared that the earlier in life children are exposed to noise pollution, the greater the effects.

Constant noise is for children and adults alike a source of stress and restlessness. Noise causes annoyance and sleeping disorders. As children go to bed earlier than adults, disturbances due to environmental noise in the evening should be considered. A quiet environment is also important as regards the mid-day nap. Children's bedrooms should not face noisy roads. A disrupted sleep also has negative effects on the long-term memory. As a rule, we should always bear in mind that adults are not always aware that some noises are unpleasant and harmful for babies and toddlers.

WHAT IS KNOWN ABOUT COT DEATH?

Cot death or SIDS (Sudden Infant Death Syndrome) are terms used to describe the phenomenon of sudden, unexpected and inexplicable deaths in children during the first year of life. In most cases the children are found dead in their beds after sleeping. Even thorough post-mortems, with numerous additional examinations, and careful examination of medical histories fail to reveal the cause of death. SIDS is surrounded by scientifically-based theories and no real answers. At present it is thought that the most probable causes of death are the breathing in of expired air or overheating, together with genetic and other unknown factors.

Cot death is, thankfully, a rare phenomenon: it affects, on average, one in 2,000 infants. The risk is highest in the third and fourth months of life and decreases the older a child becomes. The risk of SIDS is practically non-existent after the end of the first year of life. During the past 15 years the frequency of SIDS has decreased by a third. Cot death is, however, still the most common cause of death in children between 2 and 12 months of age. Although the exact cause of death remains a mystery, scientific investigations have uncovered certain risk factors. These concern certain aspects of a child's environment, or, to be more precise, the environment in which children sleep, which is why they are discussed here. Parents who consistently avoid these risk factors can reduce the risk for their child significantly. The following recommendations were published by the German Academy of Paediatrics in 2000.

1. *Infants should only sleep on their backs during the first year of life.*
   The SIDS risk is increased if babies sleep on their sides or, especially, on their stomachs. In these positions it is more likely that a child breathes in expired air or becomes too warm. It is safest for babies to sleep on their backs. There are no grounds for fears that babies who sleep on their backs could choke on their vomit.

2. *Infants should be laid in their beds in a position that prevents their heads being covered by the bedding.*
   A sleeping bag is ideal. It is best not to use any bedding at all: neither a pillow nor a blanket nor other covers are necessary.

3. *Infants should sleep in their own beds in their parents' bedrooms.*
   Scientific studies show that the proximity to their parents reduces the risk of SIDS for babies and is practical if the child is being breastfed. Babies should not sleep in their parents' beds as they could slip under the covers or become too warm.

4. *Infants should grow up in a smoke-free environment – both before and after birth.*
   Babies whose mothers smoked during pregnancy are most at risk from SIDS. This is the second most significant factor in cot death, after putting babies to sleep on their stomachs. The harmful substances which are contained in cigarette smoke and the carbon monoxide which is formed during the burning process reach the unborn child. The risk for babies who are exposed to passive smoking at home after birth is also higher.

5. *Room temperature and sleeping bags should be carefully selected to ensure a pleasant temperature for babies (i.e. not too hot and not too cold).*
   If the heating is in use a room temperature of between 16 and 18 degrees is ideal – not only for babies but also for their parents. Over-heating due to thick clothes, bedding and overheated rooms should be avoided at all costs.

6. *Infants should be breastfed if possible.*
   Breast milk is the best form of nutrition for infants: it protects against numerous illnesses and helps mothers and babies to bond. Numerous studies have shown that the SIDS risk is lower in breastfed babies.

Furthermore, parents should ensure that their children are not exposed to any other dangers while they are asleep. Toys and mobiles with ribbons,

Information on the Internet (in German)

Recommendations for an ideal sleeping environment for infants can be obtained from the following websites: www.kindergesundheit-info.de

and www.schlafumgebung.de.

cords or bits of string should be out of the baby's reach: it could strangle itself with items of this sort. The baby's cot should be free from gaps, sharp edges and projecting parts, which could cause injury.

WHAT HAZARDS ARE THERE IN AN INFANT'S ENVIRONMENT?

Parents should be aware that there are dangers in every household. Everyday items, such as knives, forks and scissors, represent a potential danger for young children. For parents this means not only changing things at home, but also their own habits. Therefore, it is important that parents are aware of the different stages in their child's development and are prepared: even younger infants can get hold of things and stick them in their mouths. When they learn how to crawl, they can soon disappear out of their parent's sight and pull themselves into a standing position, using furniture or table cloths for assistance, enabling them to reach the hot stove, for example.

Most accidents involving babies and toddlers occur in and around the home and, less often, in traffic accidents. Almost half of these accidents involve falls: they fall from changing tables, out of cots, slings and prams, topple over in their high chairs or baby walkers and babies who can crawl often fall down the stairs, from chairs or against various objects. Hot drinks and bathwater can cause scalds; Candles, stoves and grills are often the source of burns. Children are often poisoned with household chemicals, lamp oil, cleansing agents and cosmetics and injured by sharp objects. Concussion, broken bones and burns are the most common injuries sustained by infants. Deaths are mostly caused by suffocation, drowning and lethal head injuries.

Questionnaires, filled out by parents, revealed that over 90 % of parents fulfil their parental responsibility; 85 % lock away cleaning products, medicines and other chemicals. On the other hand, only 10 to 12 per cent of parents of children aged between 0 and 2 years use child-proof installations to protect their children from stoves and falling out of windows. The following points should help you to recognise and eliminate potential dangers in a child's environment.

Changing tables

Falls from changing tables are many parents' nightmare. Before you begin to change your baby's nappy you should ensure that everything you need is

at hand. During nappy changing you should always have one hand on your baby. At around three to six months of age babies try to roll onto their stomachs: the exact age varies from child to child and mostly it happens unexpectedly. The edges around changing tables should be at least 20 cm high.

Cots

The danger of suffocation is greatly reduced when cots are fitted as sparingly as possible. Babies do not require a pillow. A sleeping bag should be used instead of blankets. Bumpers around the inside of the cot are not recommended.

Ribbons and strings should be removed from items of clothing and out of your baby's reach. Ribbons on cardigans could strangle your baby and chains on dummies should be shorter than the circumference of your baby's neck. The distance between the bars on the cot should measure a minimum of 4.5 cm and a maximum of 7.5 cm, to ensure that the baby's head does not fit through (this also applies to bars on stairs and balconies).

Slatted frames should be stable in order to avoid accidents. The gaps between the slats should be narrow enough to prevent tiny feet from getting stuck when your child stands or jumps around in bed. Cots with height-adjustable frames are only safe if the distance between the mattress and the top of the bars measures at least 30 cm – even when the frame is in its highest position – otherwise, your baby could fall out of bed. The distance to the top of the bars should be at least 60 cm when the frame is in its lowest position, to prevent an older baby from climbing out. The varnish on the bars should be saliva resistant.

For more information regarding a safe sleeping environment for your child and SIDS prevention, please refer to "What is known about SIDS?"

Information on the Internet (in German)

Information on how to create a safe sleeping environment for babies:
www.kindergesundheit-info.de

and www.schlafumgebung.de

Baby baths

Mixer taps are recommended, especially those which have a thermostat. Otherwise, you should run the cold water first and then fill the bath up with warm water until the correct temperature is reached. These measures greatly reduce the risk of scalding. Make sure that you hold your baby firmly and that the bath is sturdy.

At home

When babies start to crawl and discover their surroundings nothing is safe anymore. Now it is time to lock cleaning products, medicines, cosmetics and essential oils away, to put plants on surfaces which are out of your child's reach, to keep plastic bags in a safe place and to stop leaving cigarettes and cigarette butts lying around, if you have not already done so. Your child can now also "discover" drawing pins, buttons, balls, keys, matches, knives, forks, knitting needles, batteries, nuts etc. Curious children want to sample everything – including cigarettes, bitter almonds and parts of your plants. Potting compost, plant water and pesticides are dangerous and should be kept out of the reach of children.

All electrical sockets should be covered with a child-safety fitting. Electrical appliances should be tidied away immediately after use (the VDE safety standard should be observed). Be careful with cables and cords which hang down (e.g. kettle, iron etc.). Smoke alarms are an important investment: infants in particular suffer from smoke poisoning and can suffocate easily.

- Sharp edges and corners which are on the same level as children's heads can be cushioned with special fittings. Install anti-slip devices under carpets and rugs and stop using table cloths.

- Baby walkers are dangerous as these can often cause falls and can hinder your child in its development. Playpens and safety gates in front of stairs can make looking after children easier.

- Leaving toys lying around can also cause accidents, depending on their size and structure.

- Marbles, beads and other small objects are not suitable for children under 1 year of age. They can get stuck in the windpipe (danger of suffocation) or in the nose or ears. You should not allow your child to put lids or containers in their mouths as the coatings could contain poisonous heavy metals.

Dangerous kitchens

Children love taking things out of cupboards and putting them back in again. This makes the kitchen the perfect place for adventure. Drawers and cupboards where knives and breakables are stored should be secured with child-safety catches. There are also child-safety devices for the stove, which prevent children from pulling pans with hot, liquid contents from the hob. You should also be careful with hot liquids at the table. Infants are often scalded when they are sitting in their mother's lap while she is drinking a cup of hot tea or coffee, which the baby tries to grasp. This often results in hot liquid being spilled and scalding the baby's face, chest or arms. Table cloths should not be used as children often use them to pull themselves up into a standing position, and can be injured by falling objects and spilled liquids.

Garden and surroundings

Tools (e.g. rake, cutters etc.) should not be left lying around the garden and ponds, pools etc. should either be covered or surrounded by a fence. Buckets

which are full of water are also dangerous: children's heads are so heavy that they are unable to free themselves if they fall head first into a full bucket of water. Garages and workshops also contain many dangers for crawling children (tools, nails, chemicals etc.).

Children's car seats

Babies should lie in a secure baby-seat in cars. Rearward facing baby-seats are recommended for children who weigh up to 13 kg (aged around 18 to 24 months). These should be installed on the back seat; they may only be fitted on the front seat if the airbag can be switched off, or if the child's seat carries the manufacturer's instruction, "suitable for use with air bags."

Babies should never be left alone in cars, especially during hot periods. This can lead to suffocation as a result of overheating.

Prams

Children who are able to sit should always be strapped in when they are in their prams. A pram can easily tip if the shopping net is full and the child sits up or pulls itself forwards. Be careful that your child cannot fall out of the pram when you are getting on to busses and trains.

The **Federal Centre for Health Education (BZgA)** *has published a brochure on the topic of accident prevention for parents titled, "Kinder schützen – Unfälle verhüten" ("Protecting children and preventing accidents"). It is available free of charge upon request.*

Your paediatrician can provide you with additional information as regards accident prevention at every routine examination.

There is a hotline for parents (Federal consortium More safety for children): Tel: 0228 688 34 34 (Mondays, Tuesdays, Thursdays from 9 am to 1 pm)

Poison Information Centres: see list in annex.

Information on the Internet (in German)

"Kinder schützen – Unfälle verhüten" (brochure)
www.bzga.de/botmed_11050000.html

The Federal consortium More safety for children also has a website:
www.kindersicherheit.de

IS IT A GOOD IDEA TO MOVE HOUSE AND REDECORATE WITH AN INFANT?

On the whole, the same applies here as was described in the chapter about moving and renovating. The organisation of moving or redecorating is more difficult with a baby than during pregnancy. It must be borne in mind that babies should not be exposed to indoor air that has been contaminated by products like paints, varnishes and adhesives. It is also not recommended that children spend time in freshly decorated rooms. Airing rooms thoroughly and regularly is of utmost importance.

In addition to the presence of harmful substances in the indoor air there are also other dangers: the risk of the child ingesting poisonous chemicals that are in use or have been spilled on the floor, tools and other dangerous objects which are lying around increase the risk of injury and small objects, like nails, are easily swallowed.

Babies and young children have different requirements than adults. For them, receiving intensive parental attention in a healthy environment is more important than having a freshly decorated room or new furniture.

WHAT EFFECTS CAN MOULD INFESTATION IN THE HOME HAVE?

The spores and metabolites of moulds, which are sometimes found in houses and flats, can cause health problems such as respiratory diseases, irritated mucous membranes, allergies and asthma. The metabolites of moulds can smell very unpleasant. In which concentrations the spores in indoor air represent a health hazard is yet to be determined.

As a precautionary measure, any mould found indoors should be removed.

Mould indoors does not necessarily represent an immediate health risk for those who use the rooms, but in view of the fact that mould can lead to allergies and respiratory diseases it is best to eliminate the source before any damage is done. Children especially should not spend long periods of time in rooms where mould has been found; this applies particularly to rooms which are badly affected. Whether or not children are more susceptible to mould has not yet been proven; it is best to be cautious, however, in order to minimise the risk of triggering an allergy.

Moulds grow best under humid conditions on many different materials like furniture, textiles, books etc. and even on wallpaper and plaster. The risk of mould infestation is highest in homes which are inadequately aired and where a lot of humidity is produced. Many new or freshly renovated houses provide good conditions for mould fungi to grow as they have a low rate of air exchange due to tightly shutting windows and a lack of additional ventilation. Older buildings with inadequate heat insulation and/or structural defects are also susceptible to mould growth due to condensation forming on cold walls. Mould infestation is not always immediately visible. Sometimes it grows in concealed places, like in the cavity of a wall or behind furniture, and it is only the musty, mouldy smell or the first signs of dark patches on walls, ceilings or furniture which will make you aware of its presence.

If you discover mould at home you should remove it and also, more importantly, eliminate the causes which led to mould growth in the first place. It is strongly recommended not to attempt to fight the mould growth with chemical fungicides and to use these constantly in the battle against the ever-returning mould problem. Advice on when and how to deal with mould and further tips on how to prevent damage from mould in the home can be found in the Federal Environment Agency's brochure, "Hilfe! Schimmel im Haus" (Help! Mould in the Home!).

Information on the Internet (in German)

The brochure "Hilfe! Schimmel im Haus" and further information on the subject of mould can be ordered free of charge or downloaded from the website www.umweltbundesamt.de.

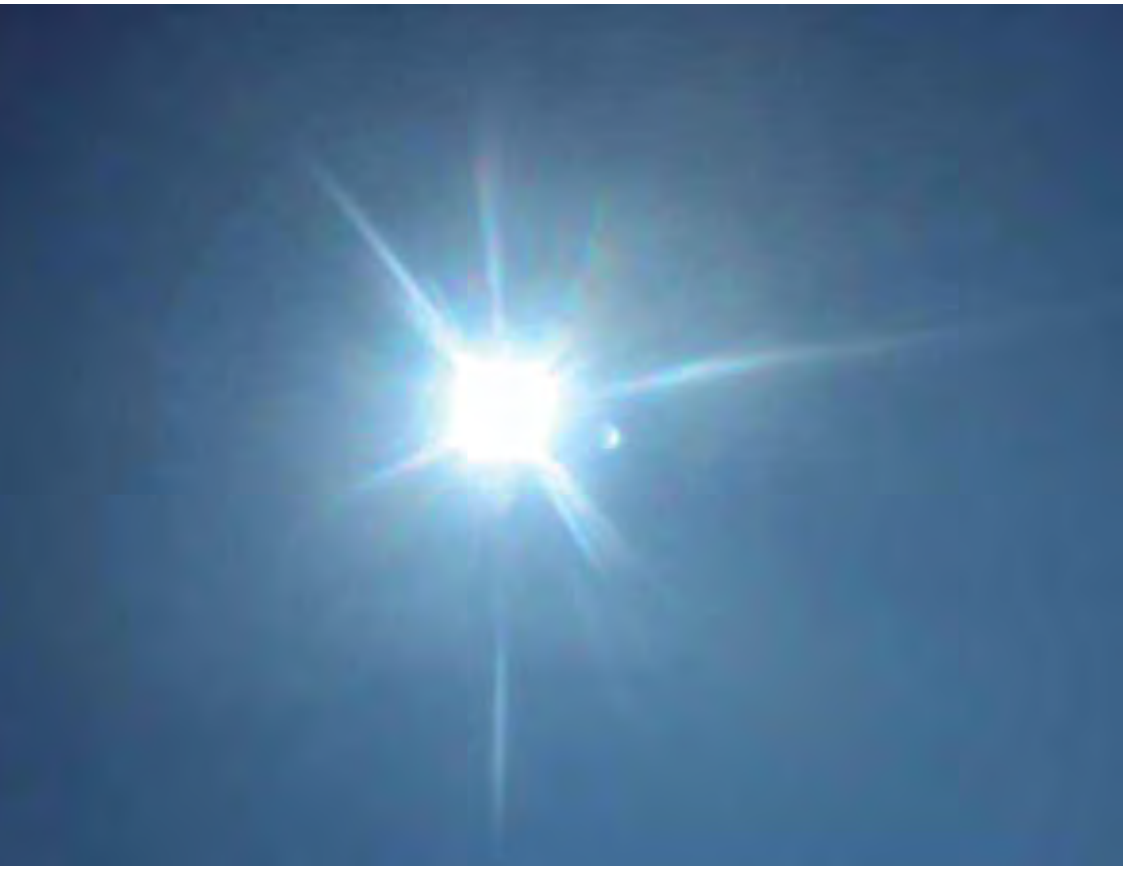
Preventive measures

- *Rooms where humidity levels are especially high (bathroom, kitchen and bedrooms) should be thoroughly aired a few times each day, even in Winter, i.e. open the windows wide for 5–10 minutes, creating a draught if possible.*
- *Do not place items of furniture directly against cold exterior walls as condensation can form behind them providing excellent conditions for mould growth?*
- *Children's bedrooms should also be aired regularly – a few times a day, if possible. This is often neglected by parents, reducing the quality of the inside air and increasing the risk of a high level of humidity, which can lead to mould growth.*
- *During the winter months, when the heating is in use, windows should be opened wide and not tilted. Tilting windows does not provide enough air exchange and can lead to the exterior walls around the tilted window becoming too cool. These cold sections can then become damp, thus providing the perfect conditions for mould fungi to grow.*
- *Cool rooms in the basement, that often suffer from dampness, are unsuitable to be used as children's bedrooms or playrooms. Carpets should not be laid in these rooms.*

SUMMER SMOG – A DANGER?

Summer smog is a mixture of pollutants which forms as a result of the influence of intensive solar radiation on numerous other substances which are present in the lower atmosphere. Ozone is the principle substance contained in summer smog, as its concentration and effects dominate.

In summer children and adults alike can be exposed to high ozone levels. Infants and toddlers are classed as a high-risk group in regard of the harmful effects of ozone because of their relatively high respiratory minute volume in comparison to their body size. Their immune system is also not yet fully mature, which means that the additional influence of ozone could further increase their susceptibility to respiratory infections.



High temperatures usually mean high ozone levels, therefore, behaving sensibly as regards high temperatures is also being sensible in view of ozone levels.

It is recommended to avoid physical exertion during midday and afternoon hours.

This also applies to kicking and screaming infants in their prams and to toddlers running around wildly, although reasonable behaviour in this respect can hardly be expected. It is recommended that parents ensure as far as possible that their children are not excited or running around at midday and during the early afternoon, when the highest ozone levels are measured, as this can cause irritation of the respiratory tract.

During periods of good weather higher levels of ozone can be measured in indoor air due to rooms being aired more intensively. Although ozone is broken down indoors relatively rapidly, it can still react with organic compounds present in items there (e.g. in wallpaper and coats of paint), depending on what sorts of materials furnishings etc. contain. Measurements taken by the Federal Environment Agency, for example, show that as a result of these reactions further harmful air pollutants can be released, such as formaldehyde.

Therefore, when ozone levels are high it is advisable to air rooms primarily in the morning and evening hours.

HOW CAN I PROTECT MY CHILD FROM HARMFUL UV LIGHT?

Infants should never be exposed to direct sunlight. Light and sunshine generally have a positive effect on a child's development – if they are enjoyed in moderation. UVB radiation is, in moderation, important for vitamin D production in the body and therefore also for the growth of bones – especially in adolescents. Ten minutes sunshine per day is adequate for this vitamin D3 synthesis.

At the same time, UV radiation, regardless of wavelength and intensity, triggers numerous effects, especially in the eyes and skin. The acute consequences of excessive exposition to UV radiation are sunburn, eye inflammations and allergic reactions of varying degrees of seriousness. The long-term effects of UV radiation include diverse forms of cancer and opacity of the eye lens. The increase in the number of cases of skin cancer during the past few decades is very worrying.

The risk of skin cancer has been linked to repeated cases of sunburn during childhood and adolescence. Parents of infants (and also older children and adolescents) should observe the following precautions:

- *Babies under 1 year of age should never be exposed to direct sunlight.*
- *Children should wear light cotton clothing, which covers the whole body, including the arms and legs, if possible.*
- *Your child should always wear a sunhat! Its face, neck and ears should also be covered.*
- *On very hot days with intensive sunlight the sun should be avoided in the hours between 11 am and 3 pm.*
- *Children and teenagers should wear cream with a high sun protection factor, which should be generously applied half an hour before going outdoors.*
- *Sunglasses for toddlers should also be 100% UV proof.*
- *Young children should not accompany their parents on visits to the solarium. Solariums are out of bounds for under-eighteens.*

ARE ELECTROMAGNETIC FIELDS HARMFUL?

Household electricity

A possible link between low-frequency fields with low intensity (e.g. from high-voltage transmission lines) and cancer has been investigated in epidemiological studies since the end of the 1970s. No evidence of an increased cancer risk was found in adults who were exposed to low-frequency fields over a long period of time. In the case of leukaemia in children the situation is quite different.

In some epidemiological studies of children, who were exposed to magnetic fields with intensities well below the recommended levels over a long period of time, a small but significant increased risk of developing leukaemia was found. If this link really exists, however, only 1% of all leukaemia cases in children could be attributed to increased exposure to low-frequency magnetic fields. In this case a maximum of 6 of the 600 annual cases of children developing leukaemia in Germany could be attributed to exposure to magnetic fields.

As in all epidemiological studies a cause and effect relationship can not be proved by the statistical link. A biological effect mechanism, which would explain the cause of leukaemia or the stimulation of growth of the leukaemia cells by low-frequency magnetic fields, could not yet be proven. The causes of leukaemia in children are generally unknown, which means that certain factors were maybe not taken into consideration during the evaluation process of the studies. As this statistical link was also shown in other studies, it is taken very seriously as a possible risk and gives good reason to take precautions.

It is recommended

- *to lay all electrical installations under plaster (they should be well-insulated),*
- *not to leave appliances on standby (especially televisions and stereos)*
- *and not to place sources of fields, which are used during the night (e.g. baby phones, electrical alarm clocks), directly next to your child's head.*

Mobile phones

It is generally safe to say that mobile phones are not suitable toys for babies and young children – the materials used in their manufacture and their many small parts are reasons enough.

Whether children react more sensitively to the high-frequency electromagnetic fields of mobile phones has not yet been scientifically proven. According to present knowledge, mobile phones are not detrimental to our health. This applies to both using a mobile phone and living in the vicinity of a mobile phone transmission mast.

Materials with a shielding effect

There are numerous products available which are said to have a shielding effect on low-frequency magnetic fields, low-frequency electric fields and high-frequency electromagnetic fields. As the effectiveness of these products is somewhat dubious the Federal Office for Radiation Protection (BfS) advises against their use.

Information on the Internet

Electromagnetic fields
www.bfs.de/en/elektro

PART III

The Environment and Fertility

CAN ENVIRONMENTAL POLLUTANTS HAVE AN EFFECT ON THE ABILITY TO CONCEIVE?

There is much concern about the accidental absorption of harmful substances from the environment and the effect they could have on human health; this is the case especially regarding women who worry that this could affect their ability to conceive and to give birth to a healthy child.

Reports on the detection of harmful substances in blood, urine and breast milk give grounds for concern that some of these chemicals could lead to unwanted effects like infertility, spontaneous abortions, premature births, inadequate foetal development and high blood pressure during pregnancy and conditions such as endometriosis[1] and ovarian diseases.

Relationships of this kind were found as a result of accidents or poisonings. When contaminants are found in low levels, which is typical for Germany nowadays, the risks are low and therefore difficult to prove. Due to legal regulations and critical consumer behaviour, the levels of the most significant harmful substances have decreased during the past few decades.

WHAT ARE THE POSSIBLE EXPLANATIONS WHEN THE WISH TO START A FAMILY REMAINS UNFULFILLED?

When the wish to start a family is not fulfilled it is often due to fertility problems and represents a great burden for many Germans and their relationships. Some of them become pregnant with the help of modern medical techniques[2].

The reasons for infertility can be found in both partners. Hormonal and organic problems are often responsible, like blocked Fallopian tubes or seminal ducts, which can occur as the result of an infection. The likelihood of becoming pregnant also decreases with the increasing age of both partners and psychological factors can also play a role. The exact reason often remains a mystery.

[1] The growth of uterine mucous membrane outside of the uterus e.g. in the Fallopian tubes or stomach.

[2] E.g. IVF (in vitro fertilisation) where fertilisation occurs in a test tube.

Recent studies report a decrease in sperm quality in the Western industrial nations from the 1940s until today. Evaluation of sperm analysis carried out in infertility clinics in Germany revealed a significant decrease in sperm concentration since the 1960s. A current investigation of sperm concentration in young German men has revealed levels which are below the European average. Reduced fertility can often be explained by a low sperm count.

The influence of certain chemicals in our environment, especially those which can affect the hormonal system, is also being discussed as a possible reason. There are indications that disrupted hormonal regulation processes during foetal or child development can lead to inferior sperm quality and an increase in infections and abnormalities of the male genital tract.

It is, however, still in discussion whether present concentrations of substances of this kind in our environment can have effects to this extent on human health.

WHAT ARE HORMONE-ACTIVE SUBSTANCES OR "ENDOCRINE DISRUPTORS"?

Some substances are similar to certain human hormones due to their chemical structure. They can therefore imitate or cancel their effects, if they are present in adequate levels. The tiniest amounts of hormones have an effect on the human organism and a hormone imbalance can have clear consequences, in many cases. Substances like DDT[1], dioxins, bisphenol A or polychlorinated biphenyls (PCB) are said to have a hormonal function (this has so far only been proved in experiments on animals and investigations into their mechanisms of action). Animal tests showed that the effects of these substances can also accumulate. It is, however, still unknown to what extent harmful substances affect human hormone levels in the concentrations and combinations in which they occur in our environment.

[1] Dichlorodiphenyltrichloroethane: an insecticide which has been banned in the Federal Republic of Germany since 1972 and in the new Federal States since 1989.

CAN PLASTIC SOFTENING AGENTS HAVE AN EFFECT ON FERTILITY?

Softening agents like phthalates are used in the manufacture of numerous plastic products, especially those made out of polyvinyl chloride (PVC). They are also used in the manufacture of toys and materials which come into contact with food. As these substances are not chemically bonded to PVC they can escape as vapours or be released on contact with water or fats. Twist-off lids, for example, are sealed with a synthetic material from which softening agents can be released, especially upon contact with fatty food. Different softening agents have different toxicological properties: in experiments on laboratory animals it was observed that some phthalates (DEHP, DBP, BBP[1]) had a toxic effect on future generations, especially on the male reproductive system and fertility. It must be assumed that the same effects could occur in humans, if phthalate concentrations were high

[1] Diethylhexylphthalate, dibutylphthalate and butylbenzylphthalate: these are some important examples of phthalate-based softening agents.

enough. The use of the above-mentioned phthalates is therefore banned in baby products and toys for children under three years of age, as children put them in their mouths where the substances could be released. Substances which affect the reproductive system are also banned in cosmetic products. The European Food Safety Authority (EFSA) has recently set the limit for the tolerable daily intake of phthalates on the basis of toxicological data. These values form the foundation for restrictions in the use of phthalates in Germany; recommendations made by the Federal Institute for Risk Assessment (BfR) state that the use of phthalates is unsuitable in the packaging of fatty food products.

Investigations in various European countries have shown that the estimated daily phthalate intake in adults is significantly lower than the EFSA's TDI values. This is not always the case as regards children, however: some younger children exhaust, or even exceed, the tolerable daily intake. This could be due to eating phthalate-contaminated products regularly (e.g. cer-

tain plant-based oils and sauces out of jars with twist-off lids). Further measures in decreasing phthalate concentrations in food and food packaging are, therefore, necessary. An EU guideline has recently been issued which extensively restricts the use of phthalates in materials which come into contact with food. Furthermore, analysis of breast-milk samples during the past few years revealed that they were not contaminated with DEHP, thus, in this respect, there are no grounds for concern as regards breastfeeding.

DO SOME ENVIRONMENTAL POLLUTANTS INFLUENCE THE SEX OF UNBORN BABIES? IS THE NUMBER OF BABY GIRLS ON THE INCREASE?

The gender ratio in newborns is remarkably constant: 106 boys to 100 girls, on average. Whether a boy or girl is born is, on the whole, coincidental. The probability of conceiving a boy or a girl could depend on parents' hormone levels at the time of conception, amongst other things.

After the dioxin catastrophe in Seveso in 1976 young men, who had been exposed to high levels of dioxins, showed altered concentrations of various sex hormones and fathered more girls. Similar trends were observed when fathers had been exposed to the pesticide vinclozolin (which works as an opponent of male sex hormones) or chlororganic pesticides. Links of this kind were only observed in cases where the dose was very high i.e. as a consequence of chemical accidents.

Birth statistics in Germany between 1946 and 2006 show a slight trend in the ratio of boys to girls in favour of girls (1.080 to 1.058). It is assumed that – apart from the effects of certain chemicals – agricultural, health and personal factors also play a role in influencing the sex of babies.

DO MOBILE COMMUNICATION FIELDS CAUSE INFERTILITY?

Scientific studies have been investigating the possibility of a link between high-frequency electromagnetic fields and male fertility since the 1980s. In summary, it was proven that high-frequency electromagnetic fields of various origins (e.g. radar, diathermic apparatus, mobile communications) have only a thermal effect on the male reproductive organs. If the fields are below the legal limits and, therefore, without thermal effects a harmful influence on male fertility cannot be proven at present.

It must be borne in mind that when using modern communication technology, like WLAN, for example, the mobile transmitters are placed increasingly in the lower abdominal region (e.g. laptops). As yet, there is no available data as regards the specific absorption rates (SAR) in the surrounding tissue, which makes risk assessment impossible. Investigations are being carried out within the framework of the German Mobile Communications Research Programme (DMF). The assessment of results, together with up-to date-national and international scientific knowledge, is expected in 2008 in conclusion of the DMF.

Information on the Internet

SAR values of mobile phones available in Germany:
www.bfs.de/elektro/oekolabel.html (in German)

Deutsches Mobilfunk Forschungsprogramm (DMF)
(German Investigative Programme for Mobile Communications)
www.emf-forschungsprogramm.de

Where is further information available?

Action Programme Environment and Health (APUG) – (Contact Address)
Co-ordination Office:
Umweltbundesamt, Fachgebiet II 1.1
Corrensplatz 1
14195 Berlin
Fon: 030 8903 1105
Fax: 030 8903 1830
E-mail: apug@uba.de
Internet: www.apug.de
(in German only)

Federal Environment Agency (UBA)
Wörlitzer Platz 1
06844 Dessau
Fon: 0340 2103 - 0
Fax: 0340 2104 - 2285
E-Mail: info@umweltbundesamt.de
Internet: www.umweltbundesamt.de/index-e.htm

Federal Office for Radiation Protection (BfS)
Willy-Brandt-Straße 5
38226 Salzgitter
Fon: 01888 333 - 0
Fax: 01888 333 - 1885
E-Mail: info@bfs.de
Internet: www.bfs.de/en/bfs

Federal Office of Consumer Protection and Food Safety (BVL)
BVL Bonn
Rochusstraße 65
53123 Bonn
Fon: 02 28 61 98 - 0
Fax: 02 28 61 98 - 120
E-Mail: poststelle@bvl.bund.de
Internet: http://www.bvl.bund.de/cln_027/nn_495478/EN/Home/homepage__node.html__nnn=true

Federal consortium "More safety for children"
Heilsbachstr. 13
53123 Bonn
Fon: 0228 68 83 4 - 0
Fax: 0228 68 83 4 - 88
E-Mail: info@kindersicherheit.de
Internet: www.kindersicherheit.de/
(in German only)

Federal Institute for Risk Assessment (BfR)
Thielallee 88–92
14195 Berlin
Fon: 01888 412 - 4300
Fax: 01888 412 - 4970
E-Mail: pressestelle@bfr.bund.de
Internet: http://www.bfr.bund.de/cd/template/index_en

Federal Centre for Health Education (BZgA)
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Fon: 0221 8992 - 0
Fax: 0221 8992 - 300
eMail: poststelle@bzga.de
Internet: http://www.bzga.de/?uid=fb509f5a9bbae3c3d5d5ba4ace228073&id=home

Robert Koch-Institute (RKI)
Nordufer 20
13353 Berlin
Fon: 030 18754 - 0
Fax: 030 18754 - 2328
E-Mail: presse@rki.de
Internet: http://www.rki.de/EN/Home/homepage__node.html?__nnn=true

National Breastfeeding Committee (BfR):
Internet: http://www.bfr.bund.de/cd/742

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ANNEX

List of Poison Information Centres in Germany

Location	Institution	Prefix	Phone
Berlin	Giftnotruf Berlin	**030**	**1 92 40**
Bonn	Informationszentrale gegen Vergiftungen des Landes Nordrhein-Westfalen Zentrum für Kinderheilkunde	**0228**	**1 92 40**
Erfurt	Gemeinsames Giftinformationszentrum Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt, Thüringen	**0361**	**730 730**
Freiburg	Vergiftungs-Informations-Zentrale Universitätskinderklinik	**0761**	**1 92 40**
Göttingen	Giftinformationszentrum Nord der Länder Bremen, Hamburg, Niedersachsen, Schleswig-Holstein; Universitätsklinikum Göttingen	**0551**	**1 92 40**
Homburg/ Saar	Informations- und Behandlungszentrum für Vergiftungen; Universitätskliniken für Kinder- und Jugendmedizin	**06841**	**1 92 40**
Mainz	Beratungsstelle bei Vergiftungen der Länder Rheinland-Pfalz und Hessen; Universität Mainz	**06131**	**1 92 40**
München	Giftnotruf München Toxikologische Abteilung der II. Medizinischen Klinik	**089**	**1 92 40**
Nürnberg	Giftinformationszentrale Nürnberg; II. Medizinische Klinik Klinikum Nürnberg	**0911**	**3 982 451**

? Do you have any other questions

which are related to environmental and health issues concerning children and have not been answered in this brochure? Do you have any suggestions for improvement? Then please contact us, so that we can improve the quality of this and other publications. Please use the contact addresses which have already been mentioned in this brochure.

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www.bio-siegel.de: Biosiegel, Page 21
www.blauer-engel.de: Blauer Engel, Page 25

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