Bundesamt für
Verbraucherschutz und
Lebensmittelsicherheit

# Abstract Report on the National Monitoring 2015

Joint report by the Federal Government and Federal States

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This Abstract Report presents a short overview about the findings of the analyses of foods, cosmetic products and commodities carried out in 2015. A full version of the Report on the National Monitoring 2015 is available in German from www.bvl.bund.de/monitoring2015. Abstract Reports on the National Monitoring from previous years can be downloaded from www.bvl.bund.de/monitoring_abstracts.

## 1 Summary

The Monitoring Scheme is a system of repeated representative measurements and evaluations of levels of substances that are undesirable from a health point of view, such as residues of plant protection products and pesticides, heavy metals, mycotoxins and other contaminants in and on foodstuffs, commodities and cosmetic products. Further details about the monitoring programme are available from http://www.bvl.bund.de/EN/01_Food/_01_tasks/02_OfficialFoodControl/04_LM_Monitoring_en/LM_Monitoring_EN_node.html.

In line with the General Administrative Provision (AVV) for the 2011-2015[1] Monitoring Programme, the following foodstuffs, commodities and cosmetic products from the population's representative market basket were examined in 2015 (market basket monitoring):

### 1.1 Food of Animal Origin

- Alaska pollock (*Theragra chalcogramma*)
- Butter
- Fallow deer (meat, including deep-frozen)
- Chicken eggs
- Salmon (*Salmo salar*)
- Sheep's cheese/feta cheese

### 1.2 Foods of Plant Origin

- Apricot
- Aubergine
- Banana
- Cauliflower
- Broccoli
- Dill
- Spelt grains
- Peas (peeled, dried)
- Peas (without pod)
- Sweet pepper
- Cereal-based infant food
- Celeriac
- Currant, sultana, raisin
- Tangerine/clementine/satsuma
- Mango
- Margarine

[1] *"Allgemeine Verwaltungsvorschrift zur Durchführung des Monitorings von Lebensmitteln, kosmetischen Mitteln und Bedarfsgegenständen für die Jahre 2011 bis 2015 (AVV Monitoring 2011-2015)", BAnz no. 198 of 29.12.2010, p. 4364ff*

- Melon/honeydew melon, cantaloupe melon
- Olive oil (virgin, extra virgin)
- Orange juice
- Oregano/marjoram
- Brazil nut
- Radish
- Rapeseed oil (cold-pressed)
- Rosemary
- Rocket salad
- Chives
- Sunflower seed (also peeled)
- Sunflower oil (cold-pressed)
- Table grapes
- Tea (*Camellia sinensis*)
- Tomato juice
- Grape juice
- Wheat grains
- Cultivated mushroom

## 1.3 Cosmetic Products

- Products for skin care (products with ethoxylated raw materials)
- Pump sprays (fragrances and deodorants)
- Mascara

## 1.4 Commodities

- Picture books and colouring booklets made from paper, carton or cardboard
- Baby bottle teats and soothers
- Household detergents
- Enamelled or ceramic-coated pots for cooking/roasting/baking
- Other items with food contact made from natural or synthetic rubber

Depending on what undesirable substances were expected, the foods were analysed for residues of plant protection products and pesticides as well as for contaminants (for instance, dioxins and polychlorinated biphenyls, perfluorinated alkyl substances (PFAS), polycyclic aromatic hydrocarbons (PAH), elements, nitrate and mycotoxins).

The mascara was tested for nitrosamines. A number of other cosmetic products were analysed for phthalates and dioxane levels.

Enamelled and ceramic-coated kitchen utensils with food contact were tested for release (migration) of elements, in particular heavy metals. Levels of primary aromatic amines were measured in other kitchen utensils with food contact. Detergents were examined for levels of the isothiazolinone preservatives, and colouring books from paper, carton or cardboard intended for children under 36 months for phthalate contents.

In addition to the market basket monitoring, the following specific subjects were examined in order to close information gaps in risk assessment and to address topical questions. This part of the programme is called project monitoring:

- Chlorate and perchlorate in food of plant origin
- Pyrrolizidine alkaloids in tea and tea-like products

- Presence of non-relevant metabolites of active substances of plant protection products in natural mineral water
- Presence of selected sweeteners in mineral water, including raw water
- Deoxynivalenol (DON) in beer

As far as comparison with results from earlier monitoring studies was possible, this was considered in the interpretation of findings. Yet it is emphasised that all statements and assessments in this report concerning the presence of substances that are undesirable from a health point of view solely refer to the products, substances and substance groups considered in 2015. An estimation of the entire exposure to certain substances is not possible because only part of the market basket can be examined per year and the substances occur in other products.
Altogether, the findings of the 2015 food monitoring programme again support the recommendation of a varied and balanced diet, in order to minimise the dietary intake of undesirable substances which is, to some degree, unavoidable.
In total, 9,904 samples of products of domestic and foreign origin were analysed in the framework of market basket and project monitoring in 2015, including 8,654 samples of foodstuffs, 592 samples of cosmetic products, and 658 samples of commodities (daily use products). The findings are presented in the following chapter.

# 2 Foodstuffs

## 2.1 Residues of Plant Protection Products and Pesticides

### 2.1.1 Food of Animal Origin

Residues of plant protection products and pesticides were found in 45 % of the tested butter samples, 18 % of chicken egg samples, and 47 % of the sheep's cheese/feta samples. Compared to findings in butter and chicken eggs in the 2012 monitoring scheme, the portions of samples with residue findings have decreased.

As in other foodstuffs of animal origin, residue findings mainly stemmed from ubiquitously present, persistent organo-chlorine compounds which used to be intensively applied in pesticides and plant protection products in the past and keep entering the food chain via environmental contamination.
Legal residue levels were exceeded in 2 samples. One finding of DDT was non-compliant with the residue limit in chicken eggs, and one finding of diazinone did not comply with the limit in feta cheese. The residues found in the foods of animal origin examined under this monitoring programme did not indicate any risk to consumers' health.

### 2.1.2 Food of Plant Origin

Residues of plant protection products were found to different degrees in all foodstuffs of plant origin examined.

The portion of quantifiable residue findings was less than 20 % in cauliflower, and less than 50 % in aubergines, peas, olive oil, oregano, chives, sunflower seed, tea, and wheat grains.

The largest portions of samples with quantifiable residues (> 80 %) were found in apricots, bananas, tangerines, rocket salad, and table grapes. These products also had the most frequent findings of multiple residues. The maximum number of residues was 20 residues in a sample of table grapes.

4.9 % of the samples of domestic products carried residues of active substances which were actually not allowed for use in that respective food crop in Germany in 2015. This concerned primarily celeriac, rosemary, and rocket salad.

No legal residue levels were exceeded in peas, melons, olive oil, orange juice, sunflower seeds, grape juice, and wheat grains. On the other hand, the largest portions of samples exceeding legal residue levels were noted in the herbs rosemary (9.0 %), dill (7.6 %) and oregano (6.5 %). In the other 22 foodstuffs of plant origin, the portions of samples with residues exceeding the legal maximum level ranged between zero and 5.4 %.

The risk assessment of findings concluded that dimethoate and omethoate residues in one sample of tangerines, tebuconazole residues in one sample of table grapes, and phenthoate in one sample of cauliflower had a potential for acute health risks to consumers.

All other residue findings, including those exceeding legal maximum levels, did not indicate acute health risks to consumers.

## 2.2 Chlorate

Chlorate was not quantifiable in cauliflower, sunflower seeds and wheat grains. In apricots, bananas, celeriac, tangerines, mangos, feta cheese and table grapes, the portion of samples with quantifiable residues was rather low, being less than 10 %. The substance was more frequently quantifiable – that is, in every fifth to tenth sample – in broccoli, melons, radish, rosemary, chives, tea, grape juice, and cultured champignon. Orange juice had the greatest portion of samples with quantifiable residues, namely 72 %. The 95$^{th}$ percentile was higher than 0.1 mg/kg in aubergines, peas, oregano, rocket salad, and chives.

In 199 samples (14.7 %), chlorate levels were higher than the set maximum level of 0.01 mg/kg.

Residues of chlorate will continue to be subject to monitoring in many products in 2016 and the following years, in order to strengthen the data basis needed for a well-founded risk assessment, which in turn will provide the basis for establishing specific maximum levels.

One monitoring project tested perchlorate and chlorate in 68 samples of cut lettuce (salad packed in bags), 60 samples of deep-frozen spinach, 25 samples deep-frozen broccoli, 65 samples deep-frozen fruits, and 140 samples of complementary infant food. The levels were mostly low in processed fruit and vegetables. While fruits (deep-frozen) carried nearly no chlorate or perchlorate at all, the processed vegetables had fairly noticeable chlorate findings, the ways of entry of which should be investigated. Findings of some single, enhanced chlorate levels in vegetables is probably owing to the handling after harvest, for instance, rinsing the products in chlorinated drinking water prior to processing. A second rising in chlorine-free drinking water would probably noticeably reduce the chlorate content. There were no noteworthy findings of perchlorate in the foodstuffs tested.

Chlorate and perchlorate levels in infant food have to comply with the provisions of the Special Diet Regulations (Diätverordnung)[2]. Chlorate must not exceed 0.01 mg/kg in the ready-to-eat infant food. While this is not a problem in cereal-based infant food, the portion of samples with non-compliant chlorate findings is relatively high in vegetable preparations (29 %) and fruit preparations (15 %). Perchlorate, too, was found to between 0.01 mg/kg and 0.016 mg/kg in 29 % of the vegetable infant food samples.

The findings show that it is necessary to continue to monitor chlorate and perchlorate levels in foodstuffs for babies and infants. This is to make sure that the business operators responsible in infant food trade make every effort to protect this particularly vulnerable consumer group.

[2] *Diätverordnung in der Fassung der Bekanntmachung vom 28. April 2005 (BGBl. I S. 1161), die zuletzt durch Artikel 1 der Verordnung vom 25. Februar 2014 (BGBl. I S. 218) geändert worden ist*

## 2.3 Quaternary Ammonium Compounds (QAC)

The quaternary ammonium compounds benzalkonium chloride (BAC) and didecyldimethyl ammonium chloride (DDAC-C10) were not quantifiable in banana, mango, orange juice, oregano, radish, table grapes, and grape juice. Apricots, cauliflower, broccoli, dill, peas, sweet peppers, celeriac, melons, chives, sunflower seeds, and wheat grains had quantifiable residues of either BAC or DDAC-C10, while aubergines, tangerines, native olive oil, rosemary, rocket salad, feta and sheep's cheese, tea and, cultured champignon contained quantifiable residues of both.

Apart from the findings in rocket salad, sheep's cheese, chives, tea, and cultured champignon, BAC and DDAC-C10 were quantifiable in only 1 to 2 samples of each of the other foodstuffs. And apart from three single findings, all other levels of BAC and DDAC-C10 found were below the preliminary residue level of 0.1 mg/kg established by Regulation (EU) No. 1119/2014 in October 2014.

In order to strengthen the data basis needed for a well-founded risk assessment and revision of current, provisional maximum residue levels, BAC and DDAC-C10 will continue to be subject to future monitoring programmes.

## 2.4 Dioxins and Polychlorinated Biphenyls (PCB)

Concentrations of dioxins, dioxin-like PCB (dl PCB) and non-dioxin-like PCB (ndl PCB) were very low in cereal-based infant food, and still low in feta and aquacultural salmon.

Testing of fallow deer meat confirmed presence of enhanced levels of dioxin-like PCB, which are characteristic for muscle meat of some other game species. Apart from that, dioxin and PCB concentrations in fallow deer are higher than in the much more consumed meat of farm animals, such as in beef.

Exposure of average consumers to dioxin and PCB from fallow deer meat is still insignificant, because of the low consumption amounts.

None of the samples tested exceeded the legal maximum levels.

## 2.5 Perfluorinated Alkyl Substances (PFAS)

PFAS are ubiquitous in the environment at low levels, which may result in a low level of natural background contamination in foodstuffs. Samples of Alaska pollock (*Theragra chalcogramma*) and salmon (*Salmon salar*) tested under this programme showed only low levels of the major substances PFOS and PFOA. The single substance PFNA was detected at a low concentration in one sample of salmon fillet, which had also the highest content in PFOA among all salmon samples. Other single substances of the PFAS were below the analytic quantification limit in the kinds of fish considered in this programme.

## 2.6 Polycyclic Aromatic Hydrocarbons (PAH)

PAH levels were found enhanced both in fermented (black) tea and in unfermented (green and other) tea. But the fat-soluble PAH contained in dried tea leaves do not enter the watery phase of the tea infusion to a noteworthy degree. Health risks to consumers through exposure to PAH are therefore not to be expected. In contrast to that, the use of, for instance, green tea powder in so-called smoothies does pose a PAH exposure problem, because here, the plant material is intended for consumption, meaning that the consumer takes in all PAH contained.

Generally, for reasons of health protection of consumers, PAH contents in foodstuffs must be as low as possibly achievable through good manufacturing practice and adequate processing conditions.

## 2.7 Mycotoxins

### 2.7.1 Aflatoxins B1, B2, G1 and G2

The foodstuffs peas, olive oil, rapeseed oil and sunflower oil, which were all tested for aflatoxins for the first time in the 2015 market basket monitoring, did not contain quantifiable amounts. Currants/sultanas/raisins and tea leaves (*Camellia sinensis*) contained very low levels, just above the quantification limit. Brazil nuts, which were also tested for the first time, displayed low levels of aflatoxins, one non-compliant with the set maximum level.

Spelt grains and sunflower seed, which were tested before in the years 2012 and 2000, showed unchanged, low levels of aflatoxins.

### 2.7.2 Ochratoxin A (OTA)

OTA was not quantifiable in olive oil and sunflower oil. The samples tested of orange juice and tea leaves (*Camellia sinensis*) carried very low levels, on average. Low average levels were also found in sunflower seed and grape juice.

While OTA levels found in spelt grains were lower than in the previous monitoring, some of the tomato juice samples had higher OTA levels.

Currants/sultanas/raisins carried the highest OTA levels among all foodstuffs tested in 2015, plus, that 5 samples did not comply with the legal maximum level.

### 2.7.3 T-2 toxin, HT-2 toxin

Formation of T-2 and HT-2 toxin strongly depends on weather conditions. Compared to the spelt grains examined under the 2012 monitoring programme, the average value of total T-2 and HT-2 toxin concentrations measured in the foodstuffs tested in 2015 was quite higher. Still, all samples tested clearly below the European reference value.

### 2.7.4 Deoxynivalenol (DON)

The monitoring project “Deoxynivalenol in beer” analysed 328 beer varieties for DON plus – on a voluntary basis – 200 beers for OTA and 137 beers for zearalenone. The tests showed that in particular DON and OTA occur in beer to considerable extent. Though the levels were generally low, beer is definitely contributing to consumers’ exposure to these unwanted toxins. As regards OTA, one sample reached nearly 25% of the legal maximum level for wine and grapes of 2 µg/kg. The findings let it seem reasonable that Regulation (EC) No. 1881/2006 should establish a maximum level at least for OTA in beer. With DON being measurable, too, in at least 50 % of the samples, establishing a maximum level for DON is also desirable.

The difficulties in classifying malt, as the basic beer raw material, in the practical application of legal maximum level, should be eliminated both with regard to OTA and DON.

## 2.8 Elements

The presence of elements, and in particular heavy metals, has been a permanent aspect of the monitoring programmes for many years now. It has been examined in the most various groups of foods and commodities. On principle, contents in toxic elements in foodstuffs should be as low as reasonably achievable.

All products subject to the 2015 market basket monitoring were analysed for aluminium, arsenic, lead, cadmium, and copper, and – depending on relevance – also for chromium, manganese, nickel, mercury, selenium, and zinc.

In the following, we present the findings of the 2015 market basket monitoring with regard to the single elements.

### 2.8.1 Lead

Food samples of animal origin examined in 2015 contained low levels of lead, as a whole. The median value of lead levels in salmon and Alaska pollock was low and roughly the same as in previous years. The lead level in sheep's cheese has declined, compared to previous years. In fallow deer, too, lead was roughly on the same low level as in previous tests.

Lead levels in the samples of vegetal origin examined were also low in most cases. Findings in sunflower seed and grape juice showed a declining tendency in lead contents compared to earlier monitoring findings. Lead levels were also low in the following foodstuffs, which were analysed for lead for the first time in the monitoring: peas (dried), Brazil nut, rapeseed oil (cold pressed), and chives. In cereal-based infant food, all lead concentrations found were below the maximum level established by Commission Regulation (EU) 2015/1005, which took effect in January 2016.

### 2.8.2 Cadmium

The foodstuffs of animal origin tested in 2015 (Alaska pollock, salmon, fallow deer, and sheep's cheese) showed very low levels of cadmium, essentially confirming the findings of earlier monitoring programmes.
As regards the foodstuffs of vegetal origin, cadmium ranged at low levels in margarines, tea, grape juice, wheat grains, cereal-based infant food, as well as in oregano, rosemary, chives, dried peas, Brazil nuts, and rape/rapeseed oil – the latter six having been subject to cadmium monitoring for the first time. The low cadmium levels in margarine, tea, grape juice, and wheat grains largely correspond to the findings of previous monitoring programmes. Cereal-based infant food had had very low cadmium levels as a whole, but the statistical index figures were slightly higher than in the 2002 monitoring.
Dill and sunflower seed showed higher cadmium levels than the rest of the vegetal foodstuffs. Oil seed such as sunflower seed are foods with potentially higher cadmium levels, because the plants draw cadmium from the soil selectively, and accumulate this element in the seed.
Regulation (EC) No. 1881/2006 provides harmonised maximum levels for cadmium in some of the foodstuffs tested in this monitoring programme. These maximum levels were exceeded in one sample of Alaska Pollock, two samples of cereal-based infant food, and one sample of chives. But the median values of the cadmium levels in these foods were low, so that the non-compliant findings should be interpreted as single cases rather than as generally enhanced levels. Three dill samples did also not comply with the maximum level.

### 2.8.3 Mercury

The foodstuffs fallow deer meat, Alaska Pollock, salmon and sheep's cheese showed very low levels of contamination with mercury. Levels in Alaska Pollock and salmon were even lower than in previous years. Findings in sheep's cheese and fallow deer essentially confirmed findings of earlier programmes.

### 2.8.4 Copper

Median values of copper levels in the foodstuffs of animal origin tested ranged between 0.32 mg/kg and 1.58 mg/kg, and thus on a low level. Median copper levels of the majority of foodstuffs of vegetal origin ranged from 0.057 mg/kg to 5.80 mg/kg, which is also inconspicuous.

In contrast to that, copper levels in Brazil nuts and sunflower seed were clearly higher. Still, none of the findings exceeded the maximum residue level established by Regulation (EC) No. 396/2005 for these foodstuffs. Only 2 samples of rosemary did not comply with the respective maximum residue level in that regulation.

### 2.8.5 Aluminium

For most of the foodstuffs analysed for aluminium under the 2015 programme, there are no monitoring data from previous programmes for comparison.
The tested foodstuffs of animal origin (Alaska pollock, salmon, fallow deer, and sheep's cheese) showed low aluminium median levels of less than 1 mg/kg.
The majority of vegetal foodstuffs tested had median levels ranging from 0.500 mg/kg (in Brazil nuts) to 2.90 mg/kg (infusion of *Camellia sinensis*). The spices oregano, chives, dill, and rosemary were found to contain relatively high amounts of aluminium. Particularly conspicuous were the high median levels in dill and rosemary, of 6.427 mg/kg and 10.4 mg/kg, respectively, and the high maximum levels in dill (689.0 mg/kg) and oregano (320.0 mg/kg). The high levels in these spices might be attributable to plants accumulating aluminium from the soil in growing areas. However, low consumption amounts of these spices, and thus low exposure, allow assuming that there is no health risk to consumers. The findings should still be reason to continue to monitor aluminium levels in spices in future programmes. Spice growers should further be encouraged to try and take suitable measures to minimise aluminium contents in spices.

### 2.8.6 Arsenic

Arsenic levels in foodstuffs of animal origin were evaluated as low. Comparably higher arsenic levels were found in Alaska pollock and salmon. Fish accumulate various substances, including elements, from their natural environment, which may explain enhanced arsenic concentrations in fish. Arsenic is present in fish and sea fruit mostly in the form of less toxic organic compounds, however.

Vegetal foodstuffs also contained arsenic at low levels. Wheat grains were not only analysed for total arsenic, but also for the portions of inorganic arsenic. These, too, were very low.

### 2.8.7 Nickel

The medians of nickel levels were low in most of the vegetal foodstuffs examined. Only dried peas, Brazil nuts and sunflower seed showed relatively enhanced nickel levels. This is attributable to the fact that pulses, nuts and oil seed take up more nickel from the soil.

### 2.8.8 Chromium

Chromium levels were low in all tested foodstuffs.

## 2.9 Nitrate

Dill was found with 18 times the nitrate content of chives, the median levels being 1 361 mg/kg in dill and 75 mg/kg in chives. Yet the low consumption amount of dill means a low degree of exposure and therefore no health risk to consumers.

## 2.10 Perchlorate

Perchlorate was quantifiable in nearly all foodstuffs subject to the 2015 market basket monitoring. Quantifiable amounts occurred most frequently in fresh spices (dill, oregano, and rosemary), and in tangerines, melons, rocket salad, and tea. High perchlorate levels were conspicuous in rosemary and rocket salad. In contrast to that, apricots, aubergines, bananas, cauliflower, broccoli, dried peas, sweet peppers, cereal-based infant food, celeriac, radish, sunflower seed and table grapes contained only low amounts of perchlorate.

The legal evaluation of the perchlorate levels found in this monitoring programme is based on reference values agreed by the European Commission at a meeting of the Standing Committee on the Food Chain and Animal Health on 16 July 2013 that were in effect during the time of the programme. The reference value of 0.5 mg/kg was exceeded in one out of a total of 30 samples of dill, and in one in a total of 74 samples of rocket salad. Findings in all other foodstuff samples were below the reference values.

One monitoring project tested perchlorate and chlorate in 68 samples of cut lettuce (salad packed in bags), 60 samples of deep-frozen spinach, 25 samples deep-frozen broccoli, 65 samples deep-frozen fruits, and 140 samples of complementary infant food.
See paragraph chlorate.

## 2.11 Pyrrolizidine Alkaloids

One monitoring project tested a total of 291 tea samples, including 9 tea varieties, for pyrrolizidine alkaloids (PA). The aim was to verify data on pyrrolizidine contents in various black and herbal tea varieties obtained by the Federal Institute of Risk Assessment (BfR) and the European Food Safety Authority (EFSA) in earlier analytic programmes. In addition to that, the monitoring project aimed at finding out whether minimisation measures the tea industry started in 2013 had produced first successes.

As a whole one can say that pyrrolizidine alkaloid contents in tea were lower than those reported in 2013 and 2014. A particularly clear decline in total PA average levels is to be noticed in fennel, lemon balm, black, and green teas tested.

Action levels agreed in 2015 by the working group on “Foods, commodities, wine, and cosmetics” of the *Laender* Commission on Consumer protection (LAV) were nonetheless exceeded in 24 % of the samples of chamomile flowers, 22 % of herbal tea samples, 29 % of lemon balm samples, 35 % of mint tea samples, and 63 % of Rooibos tea samples. Further reduction of PA contents in herbal teas should be an aim, to the end of health protection of consumers.

## 2.12 “Non-relevant Metabolites” of Active Ingredients of Plant Protection Products

One monitoring project tested a total of 772 samples of natural mineral water for 17 “non-relevant metabolites (nrm)” of active ingredients of plant protection products. The total amount of samples was made up of 343 samples of carbonated natural mineral water, 45 samples of natural mineral water without carbonation, and 384 samples of raw water for natural mineral water.

More than 10 % of all tested natural mineral waters were contaminated with non-relevant metabolites, which justifies doubts in the original purity of these waters. Some single measurements were higher than half the health-related reference level for drinking water. As a whole, raw water had more quantifiable findings of non-relevant metabolites than finally sold product, which might be a hint to unauthorised processing practices. In such cases, mineral water manufacturers should be inspected, and measurements possibly made at the various processing steps, to clarify this question.

As contents of non-relevant metabolites will not change at short term, monitoring tests should be repeated after an appropriate period of time.

## 2.13 Sweeteners

One monitoring project analysed sweeteners in natural mineral waters and in raw waters for these.

A total of 151 measurements (corresponding to 4 %) produced concentrations of sweeteners higher than the limit of quantification of 0.05 µg/l. 92 of these findings (60.9 %) were owed to

acesulfame-K, and 43 (28.5 %) to cyclamate. The sweeteners aspartame, neohesperidine, and nectame were not found in quantifiable amounts.

We were not able to make out a trend in the number of quantifiable findings of sweeteners in relation to the different matrices – natural mineral water with carbon dioxide, natural mineral water without carbon dioxide, and raw water for mineral waters – all the more as the number of samples of waters without carbon dioxide was very small compared to the other two matrices.

The highest concentrations found were those of acesulfame-K (in all three matrices), the highest being 7.52 µg/l. These were followed by cyclamate (also in all three matrices), with a maximum concentration of 2.80 µg/l.

Only in acesulfame-K, arithmetic means of concentrations were higher than the limit of quantification.

As regards concentration findings in raw and finished mineral waters, no differences could be made out either.

Clear regulations are not yet provided concerning the presence of sweeteners in natural mineral waters, making an evaluation and potential contesting of what is called “original purity”, and the trade name “natural mineral water” difficult. Regulations settling this matter would be desirable.

# 3 Cosmetic Products

## 3.1 Nitrosamines in mascara

Compared to the findings in hair dyes in 2014, the concentrations of the nitrosamine NDELA found in mascara are higher. While only 4.2 % of the hair dyes had quantifiable contents of NDELA, and the maximum concentration was 362 µg/kg, 24.1 % of the mascara samples had quantifiable concentrations, with the maximum finding being 488 µg/kg. Though the amount of mascara applied is actually very low, the general principle of minimising the nitrosamine content still holds for mascara, as for all cosmetic products.

The data shows that, as an orientation value, a nitrosamine concentration of 15 µg/kg seems to be technically unavoidable in mascara.

## 3.2 Phthalates in Body Deodorants and Fragrances (Pump Sprays)

Di-ethyl phthalate (DEP), which is toxicologically not relevant, was found in 35.8 % of body spray samples at levels between 3.5 mg/kg to 11.3 mg/kg.

Sum contents of the phthalates di-ethylhexyl phthalate (DEHP), di-n-butyl phthalate (DBP) and benzylbutyl phthalate (BBP), which are toxic for reproduction, were at very low levels, apart from in one perfume oil sample. The sum concentrations were below 15 mg/kg in 95 % of the samples.

The perfume oil in question had a DEHP concentration which was 160 times higher than the concentration of 0.01 % described as safe by the EU Scientific Committee on Consumer products (SCCP). While this is a single case among all other findings, it still shows that not all manufacturers have proceeded to changing their production to using less toxic phthalates.

Levels of di-isobutyl phthalate (DIBP), which is classified as a category 18 CMR-substance, were very low. DIBP was found only in one eau de toilette/eau de perfume at a concentration of 2.7 mg/kg, which does not pose a measurable risk to consumers, according to the EU SCCP.

### 3.3 1,4-Dioxane in Skin Care Products with Ethoxylated Raw Materials

The test results showed that the orientation value for what is technically avoidable in 1,4-dioxane in cosmetic products should be adjusted to the state of technology, and lowered from the current 10 mg/kg to 5 mg/kg.

## 4 Commodities/Daily Use Articles

### 4.1 Release of Elements (Migration) from Enamelled or Ceramic-coated Metal Pots Used for Cooking/Frying/Baking/Roasting

For assessing findings of migration of elements from enamelled or ceramic-coated cooking/baking/frying/roasting pots with regard to deriving migration limits according to the ALARA principle, we used the European Council's recommendations for metals and alloys as a basis.

The test results showed that, apart from in cobalt and lithium, 90 % of the enamelled metal pots complied with both provisional migration limits and the specific migration limits specified in the European Councils technical guidelines for metal food contact products. Arsenic is a toxic metalloid, the provisional migration limit was exceeded two times and the specific migration limit was exceeded three times.

In ceramic-coated metal pots, 95 % of the samples complied with the above-mentioned migration limits.

Migration of elements more than to the technically unavoidable degree is undesirable from a preventive health protection point of view. The migration of namely cobalt and lithium from enamelled food contact products should therefore be subject to closer examination under the points of view of technical avoidability and relevance to consumers' health.

The monitoring findings showed that 10 % of the enamelled pot samples exceeded roughly tenfold the European Council's current recommended migration limits (evaluation levels) for cobalt and lithium in metal food contact products.

### 4.2 Isothiazolinones in Household Detergents Containing at Least One Isothiazolinone by Label

The monitoring showed that the mixture of 2-methyl-4-isothiazolin-3-on (MI) and 5-chloro-2-methylisothiazolin-3(2H)-on (CMI) is used only in few products again (14 out of 262), while MI is frequently used as a single raw material or in combination with benzisothiazolinone (BIT) in washing and cleaning detergents. MI was quantified in 73.2 % of the samples, the median value being 20.4 mg/kg. BIT was quantified in about half of the samples, the median being 5.3 mg/kg. In both substances, 10 % of samples had concentrations of about 50 mg/kg and higher. Both substances being allergens by contact, the products concerned might harbour an increased allergy risk. The limit value of 0.0015 % for a CMI/MI mixture, at which a product containing it must be labelled with warning phrase H317 "May cause allergic skin responses", was exceeded in 2 samples (1 washing detergent, 1 cleaner). Direct skin contact with the un-thinned products should be avoided as they contain the mentioned preserving agents in concentrations higher than the specific limit defined by the CLP Regulation. In order to protect sensitised persons, products containing concentrations equal to or higher than 1/10$^{th}$ of the specific concentration limit should be labelled with EU standard phrase 208: "Contains (name of the allergenic substance). May cause an allergic reaction." In total, 43 samples did not comply with the specific concentration limits for CMI/MI, BIT, or octylisothiazolinone (OIT).

## 4.3 Phthalates in Colouring and Picture Books from Paper, Carton, or Cardboard

Not all phthalates subject to this monitoring were quantifiable in all samples. Di-methyl phthalate (DMP) and di-n-octyl phthalate (DNOP) were not quantifiable in any sample. Benzyl-butyl phthalate (BBP), di-ethyl phthalate (DEP), and di-isobutyl phthalate (DIDP) were either not quantifiable, or quantifiable at very low levels. Though phthalates that are classified toxic to reproduction have been found in quantifiable amounts in a large proportion of the colouring and picture books, actually non-compliant levels were found only of di-n-butyl phthalate (DBP) in 2 out of 110 samples.

In picture books, suitable for children under 36 month di-isopropyl naphthalene (DIPN) was quantifiable in 25 %, in other picture books in 58.3 %, and in colouring books in 32.8 %. The proof of DIPN indicates that not only fresh fibres but also recycled fibres where used in these products.

## 4.4 Primary Aromatic Amines in Food Contact Products Made from Natural or Synthetic Rubber

Apart from a few exceptions (4 out of 129 samples), all sample rubber products complied with the limit value of 0.01 mg/l applicable to food contact products made from synthetics.

Samples of soothers did not exceed any limit values. The maximum concentration measured was 0.001 mg/l.

95 % of the samples of food contact rubber products (sealing rings, teat rubbers, hoses) contained total aromatic amine concentrations below 0.009 mg/l. Relatively higher levels were actually found, of all things, in suckers of baby milk bottles, that is, in a product intended for oral contact in the most vulnerable consumer group, babies. 10 % of the tested bottle teats carried sum primary aromatic amines concentrations of more than 0.022 mg/l.

The data obtained in this monitoring might serve as a basis for further risk management measures with regard to primary aromatic amines in food contact products made from rubber.