Activities of the state in guaranteeing food safety

Does the state know the risks that arise from pesticide residues in food and inform people about them?

Report of the National Audit Office to the Riigikogu
Tallinn, 5 June 2019

Dear readers,

Big solutions often hide behind simple questions. Who would've thought that some of the problems related to food safety would be solved if the officials in the area of government of the Ministry of Rural Affairs finally agreed on what a carrot is. How come? Apparently, the Agricultural Board sees a carrot as a plant, but to the Veterinary and Food Board, it is food. Which of them is right? Both of them are. Which of them is wrong? Both of them are. A carrot is not just a plant or food. A carrot is both a plant and food. But it's also clear that carrots are not grown just for the sake of it, but as food for people to consume. If both agencies conceded that a carrot is both a plant and food, and organised their work accordingly, we would have a considerably better overview of the pesticide residues that food grown in Estonia contains.

Namely, the Agricultural Board is responsible for guaranteeing plant health and the Veterinary and Food Board for food safety, i.e. protection of people's health. If you ask these authorities whether Estonian food has become less contaminated, the first of them will not give you an answer, because they don't consider themselves responsible for food safety and therefore don't collect information that is generalised enough for the assessment of food safety – they only assess plant health. The Veterinary and Food Board, however, cannot answer this question either, because they are not responsible for growing Estonian food and don't collect information about the pesticides used when the plants are grown.

But we want to be certain that the food sold in Estonia doesn't harm our health. We want to trust the Ministry of Rural Affairs and the Veterinary and Food Board when they say that we can eat any food that is sold without having to worry that the chemical residues the food contains could cause health problems to us or our loved ones. If there can be residues in food which according to some scientists may cause problems, and other scientists claim that there is no proof of this, then we want to know about this dispute. We want to make our own choices and do what's best for us and our families.

The findings made by the audit of the National Audit Office about food analyses, incl. the problems in the interpretation of the lab tests of pesticide residues and the failure to assess the health impact of contaminants, undermine the trust that is so important. During the audit, we analysed the information concerning food safety in much greater detail than the consumers would ever be able to do. We saw that the food tests carried out are actually not adequate for making generalisations, and data are processed in a manner which shows that food is less contaminated than it actually is. We found that lab results are processed according to an incomprehensible methodology in a manner that shows a lower pesticide residue content that the actual one.

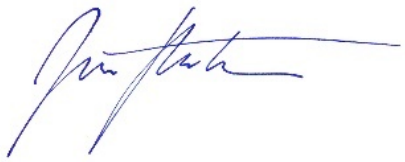
We found that important information has been lost in the generalised information. For example, 75% of the fruits in the shopping baskets of our people are imported, but analyses of organic products and food grown in Estonia comprise a disproportionately large share of lab tests. Estonian fruits and vegetables, not to speak of Estonian organic produce, contain less pesticide residues on average than food imported from Southern

Europe. This means that our actual food selection is not taken into account when the analyses are made. For example, the content of pesticide residues has been within limits in some of the analysed food, but people should not eat such food in large quantities or every day in order to prevent exceeding the level that is harmful to the body. There are fruits that contain residues of ten-odd pesticides, the combined effect of which on the body is not known. Although the European Union has established a system for preventing harmful food reaching people, we've usually consumed fresh fruits and vegetables before their harmfulness is identified and they have been withdrawn from the market.

The food production chain consists of a long list of parties that we should trust and whose trustworthiness should be additionally confirmed by various supervisory authorities: chemical industries, that have to prove with research that the pesticides they produce are safe and give truthful information about their products; food farmers, who should not use too many or unauthorised pesticides; food industries that should not use substances that are harmful to health in their industrial process; and finally EU and Estonian officials, who decide on the authorisation of pesticides and have created rules for guaranteeing food safety, and inspect compliance with these rules. However, when we analysed supervision of food safety, we found that compliance with rules is not checked as often as required.

Many persons from scientists to civil associations deal with the problems raised in the audit all over the world and information about shortcomings in the food safety system is easy to find.

And yet, we can still believe that Estonian food is generally the least contaminated food available. Despite this, it would be important to receive more and better information from the Veterinary and Food Board about possible risks, so we could be cautious and informed consumers.



Janar Holm
Auditor General

5 June 2019

Activities of the state in guaranteeing food safety

Does the state know the risks that arise from pesticide residues in food and inform people about them?

Summary of audit results

What did we audit?

During the audit, the National Audit Office analysed whether the risks related to food have been identified, the laboratories that analyse food measure up, food manufacturers are supervised and consumers are informed about the hazards related to food. The audit focused on the hazards in plant-based food caused by pesticide residues. The audit complements the audit "Activities of the state in guaranteeing safety of plant-based food" completed by the National Audit Office in 2009 because this report describes problems raised in the previous report that have still not been solved.

Why is this important to taxpayers?

Food that is harmful to health or unfit for consumption should not be sold to consumers. Consumers can make the best choices for their health if they know the possible hazards related to the pollutants contained in food and make their food choices according to the principle of moderation and diversity. Consumers must be able to trust food manufacturers, handlers, sellers and the authorities that the food sold to them is safe.

In order to justify this trust, the Ministry of Rural Affairs, the Veterinary and Food Board as well as the Agricultural Board, which controls the use of pesticides, must identify the risks related to food, inform consumers about them and exercise supervision. They must also guarantee that those who violate food safety requirements are punished and hazardous food is removed from the market

What did we find and conclude on the basis of the audit?

In the opinion of the National Audit Office, the Ministry of Rural Affairs and the Veterinary and Food Board should not claim that the food sold in Estonia is safe, because the quantity of food studies and laboratory analyses is not sufficient and there are omissions in supervision. These authorities do not inform people adequately about the risks related to the pesticide residues contained in food. In the opinion of the National Audit Office, consumers are misled to believe that food is becoming less contaminated.

Observations of the National Audit Office about the information given to consumers, which is misleading for the following reasons:

- The message of the Ministry of Rural Affairs and the Veterinary and Food Board that the food sold in Estonia is safe is based on a small number of laboratory analyses, which are not sufficient to make generalising conclusions about all of the food sold. Analyses of Estonian organic food and other food grown here form a disproportionately large share in comparison with consumption,

which makes the impression that food is cleaner than it actually is, as local food usually contains fewer pollutants than imported food.

- The information presented to the consumers creates the incorrect impression that the active substances of all pesticides are analysed in all samples taken. Actually, the content of a specific active substance is only analysed in some samples, but the general public are told that the substance was not present in any of the analysed food.
- The results of the laboratory analyses are processed, which distorts the information given to consumers and makes it seem that the content of pesticide residues in food is smaller than it actually is. Fifty percent is subtracted from the lab results on the pretence of the so-called expanded measurement uncertainty, which is why food seems less contaminated than it actually is. Results that have been processed in this manner and their presentation to the general public do not show the extent to which limits were actually exceeded.
- Consumers are not informed about all hazards, such as the combined effect of plant protection product residues in food and their harmful impact on the hormonal system. Such hazards have been approached in many research papers and the European Food Safety Authority is currently analysing them as well. The Ministry of Rural Affairs has not commissioned any research for broader assessment of the food risks related to pesticide residues and informing consumers about them.

Observations of the National Audit Office about the activities of the Ministry of Rural Affairs, the Veterinary and Food Board and the Agricultural Board:

- The Ministry of Rural Affairs has no information that would tie the eating habits of Estonians to the pesticide residues found in food and the resulting health problems. The reason for this is that no such research has been commissioned. The studies of the European Food Safety Authority have so far been relied on, which may not consider the specific eating habits of people in Estonia. In comparison with the audit carried out 10 years ago, it's good to see that an overview of the eating habits of Estonians has been prepared. However, commissioning studies calls for cooperation between specialists of food safety, agriculture and health, who should be able to assess the risks and phrase the subjects of research. The National Audit Office pointed out the lack of risk assessments and studies as early as 10 years ago.
- The Ministry of Rural Affairs and the Veterinary and Food Board currently focus only on the identification of the permitted maximum quantities of pesticide residues in food. However, the risk to health is not only related to exceeding the permitted residue quantities in one or several foodstuffs but also depends on the quantity of the residues in foodstuffs eaten. Special attention should be given to more sensitive groups, such as pregnant women, small children and vegans. At present, neither of the authorities assesses the hazard that arises from the accumulation of too many residues for a person's body weight. The pesticide residues that are harmful to health may therefore accumulate in people's bodies and cause health problems.

- The Veterinary and Food Board and the Agricultural Board plan supervision without considering which crops are treated the most with pesticides and fertilisers, as they haven't considered the collection of such information important. Other aspects are taken into account during supervision, such as the size of the field. However, from the viewpoint of food safety it's more important to check the producers whose products are likely to contain more pesticide residues. As the number of circumstances that are and should be checked keeps increasing, the authorities get around to checking many agricultural producers after intervals of more than five years.

- At present, Estonian laboratories are able to determine the majority of pesticides residues permitted on our market and most commonly found in food. However, things may change, as the equipment is getting old and there isn't enough money to replace it. As the number of orders is small, they are divided between several laboratories and the equipment is underutilised, so the laboratories themselves are unable to earn the money needed to update their equipment.

- The Veterinary and Food Board is unable to guarantee that perishable foodstuffs (e.g. fruits and vegetables) which contain hazardous quantities of pesticide residues do not reach consumers. The reason is that the Veterinary and Food Board has been receiving the lab results within a month so far. When hazardous food has been detected by another country that has announced this via the rapid alert system of the EU, identifying the distributors of such food in Estonia takes time. Thus, hazardous food is sold to consumers before the Veterinary and Food Board can stop the sale of such food.

Important recommendations of the National Audit Office to the Minister of Rural Affairs and the Director General of the Food and Veterinary Board:

- Inform the general public more about the pesticides residues found in food and potential health risks, incl. present the data of analyses in a manner that makes them unambiguously understandable. Publish the data of analyses in a manner that makes it possible for consumers to make informed choices when consuming food. Proceed from the actual lab results when presenting the results.

- Identify the pesticide residues that pose the biggest threat to people, and ensure that the food that's consumed the most and grown by using the biggest quantities of pesticides is analysed.

- Collect information about the plants on which pesticides and fertilisers are used as well as about their quantities. This would help find possible violations and plan risk-based supervision.

Response of the Minister of Rural Affairs: the ministry agreed that more analyses of pesticide residues contained in food could be ordered and more studies could also be carried out. The Minister found that considerably more money should be allocated to research and development in order to broaden risk assessment and added that an application for getting this money from the budget of 2020 has been submitted. As for obtaining better data about the use of pesticides and fertilisers, i.e. establishing a digital field book, the Minister noted that it

would be necessary to assess whether the costs this will cause to agricultural producers and the state corresponds to the benefits to be gained. The Minister said that the possibility to connect the state's information system with the electronic field books of agricultural producers could be analysed within the scope of the knowledge transfer programme, which deals with the big data of agriculture.

Response of the Veterinary and Food Board: the Director General of the Board agreed that informing the general public about the results of analyses of pesticide residues must be improved. The Director General finds that the results of laboratory analyses of food could be presented to consumers in a more understandable manner. In the opinion of the Director General, information about the crops on which Estonian producers use pesticides and the quantities in which they are used would be useful for the Board, as it would help it plan supervision that is more based on risks.

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Overview

Principles of food safety

Hazard – the biological, chemical or physical factor or status of food that may have a harmful effect on people. The possible immediate and/or short-term and/or long-term impact on the health of not only the person who consumes the food, but the next generation, possible cumulative toxic effect, etc. are taken into account when decisions are made on the adverse health effects of food.

1. Food is one of the most important daily basic needs of people and as it's ingested every day, it has a direct effect on people's health. Maintaining human life and health is a central value of the European Union, and protection of human health at the highest level and implementation of precautions have therefore been set as the main pillars of the food safety policy. The objective of food safety is to prevent the adverse effects of food on the health of people[1]. Pursuant to European Union (EU) law, a hazard lies in food that is harmful to health or unfit for consumption.

Pesticide – a (usually) synthetic substance consisting of at least one active substance and formulants, which is meant to destroy certain forms of life, such as plants (herbicide), insects (insecticide), fungal mould (fungicide).

2. The measures for protection of human health are governed by rules of food cleanliness in EU law[2]. The cleanliness of food and consequently its safety also depend on whether and in which quantities pesticides and fertilisers are used to farm the food. This determines the quantity of various pesticide residues left in food and the effect this will have on human health. Food safety depends further on how it's handled on its journey from the field to people's plates: storage in warehouses, production of food in factories, transportation, sale to people (see Figure 1).

3. The majority of food safety rules are the same in the European Union because of the common food market, i.e. goods can be freely sold in all EU Member States. The European Food Safety Authority (EFSA[3]) has an important role in food safety and its tasks include giving scientific advice related to food safety and make proposals to the European Commission for establishment of food safety requirements, and to collect and analyse data, which makes it possible to describe and monitor the risks that affect food safety[4].

4. The EFSA analyses whether food may contain pesticide residues and in which quantities as well as which additives and in which quantities may be added to food. Although the rules are the same, it's also important for Member States to contribute to the establishment of these rules. The eating habits of people in different countries are not the same and each state must assess potential hazards themselves as well.

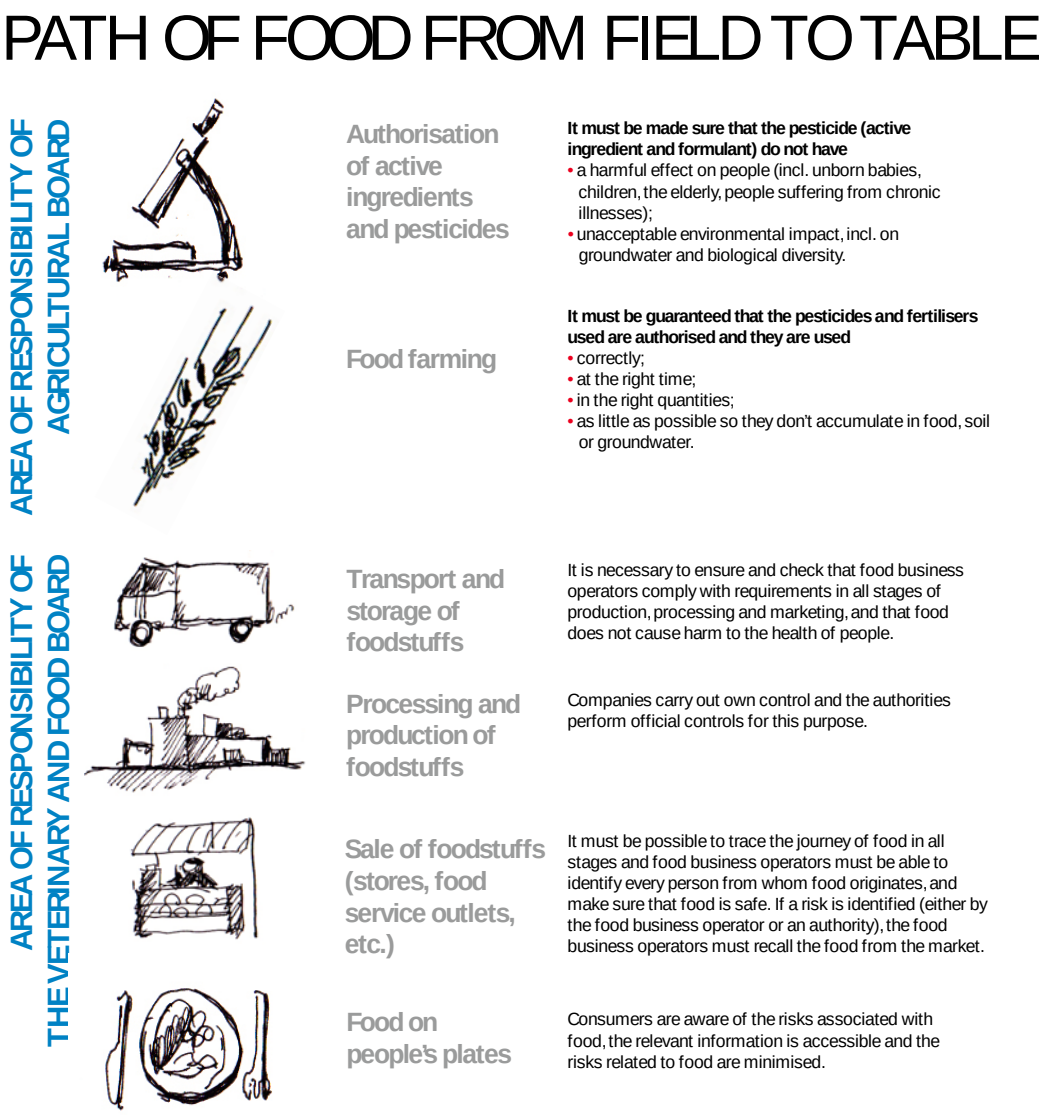
[1] Article 3 (14) Regulation No 178/2002 of the European Parliament and of the Council laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

[2] Regulation (EC) No 852/2004 of the European Parliament and of the Council on the hygiene of foodstuffs and Regulation (EC) No 853/2004 of the European Parliament and of the Council laying down specific hygiene rules for food of animal origin.

[3] https://www.efsa.europa.eu/

[4] Regulation No 178/2002 of the European Parliament and of the Council laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.

Figure 1. Guaranteeing the safety of food of plant origin



Source: National Audit Office

Contaminant – a substance found in food that has ended up in food upon primary production, handling or as a result of environmental pollution, and that may be hazardous to human health or deteriorate the qualities of the food, e.g. chemicals, mycotoxins.

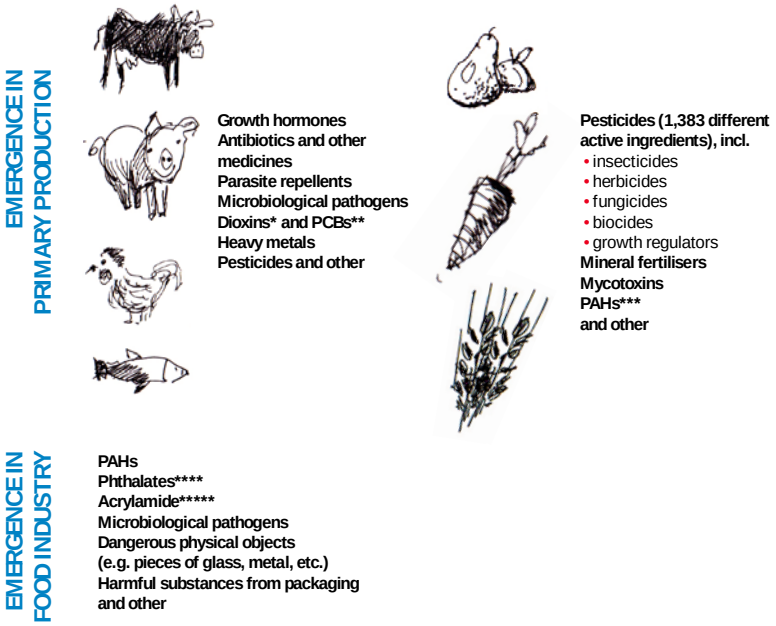
Primary production – growing or keeping plants or animals. Primary production also covers hunting, fishing and picking natural products.

Sources of risk

5. Food may get contaminated in all parts of the food production chain: growing, processing, preservation, packaging, etc. The contaminants that end up in food come from several sources. For example, the cleanliness of food is influenced by the pesticides used when it is grown, soil and air pollution, the place where a plant grows and the water it gets, the chemicals used upon storage (e.g. rodent or insect repellents in warehouses). It's also important how foodstuffs are stored, processed, packaged, etc.

6. Some examples of the sources and manners of contamination are given in Figure 2. The audit of the National Audit Office focused on the residues of pesticides (herbicides, fungicides, insecticides) used in primary production.

Figure 2. Contaminants in food and contamination in food production chain



* Dioxins – persistent bioaccumulative substances present in the environment. They reach the human body via the food chain and damage the immune, endocrine and/or nervous system, cause tumours and malformations.
** PCBs or polychlorinated biphenyls – cyclical organic compounds that are widely used in technical equipment. They are permanent, very toxic and carcinogenic compounds. They bioaccumulate in the food chain in such a manner that the substance content increases in the tissue of the consecutive organisms.
*** PAHs – polycyclic aromatic hydrocarbons, which are released from the incomplete burning of organic substances. The main sources of PAHs in the environment are industrial processes, traffic and burning of fuel at home, etc. These substances are found in water, air and soil. They may also emerge in the course of cooking (grilling, frying, smoking). They cause cancer.
**** Phthalates – a group of chemicals used in plastic products (e.g. food packaging and elsewhere) to make the softer and more elastic. Phthalates are used in plastic food packaging, cosmetic and health products, toys, etc. Many of them are reproductive toxicant substances.
***** Acrylamide – a substance that emerges when food rich in starch is processed at high temperatures (over 120 °C), e.g. baking, frying and roasting. Used also in industry, incl. in cosmetics and food packaging. May cause tumours and damage DNA.

Source: Ministry of Rural Affairs

Pesticides – products that cover biocides in addition to plant protection products. Pesticides prevent, destroy or control harmful organisms (pests) or illnesses, or protect plants or plant products during production, storage or transportation.

Biocide– a substance or product with a broader of scope of application than pesticides. For example, biocides are used for disinfection of warehouses and means of transport.

Active substance – a substance with a predetermined action used in a pesticide. Active substances are chemicals, plant extracts, pheromones as well as micro-organisms (including viruses).

Source: National Audit Office

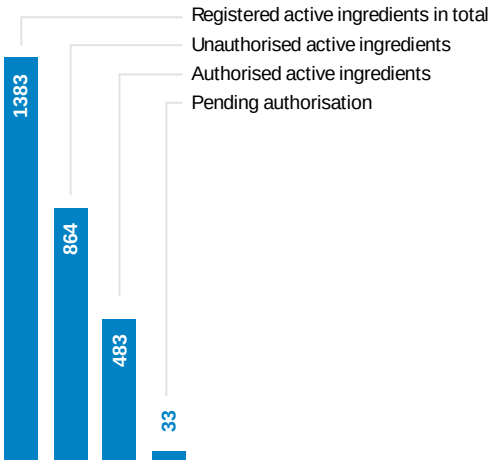
Safety thresholds and limits of active substances of pesticides

7. A number of various chemicals (active substances) are used in the pesticides meant for food production. The data of these substances can be found in the EU pesticide database, which contains information about 1,363 active substances[5]. The toxic effect of these substances is described, among others, and the database also contains information on the authorisation to use the substances (see Annex A on the toxicity of authorised substances).

8. The use of 483 substances was permitted and the use of 864 substances was prohibited at the time the audit was carried out (see Figure 3). Each Member State can decide on whether to prohibit or permit the use of a pesticide containing an active substance approved in the EU in their state. The use of 161 active substances is permitted in Estonia.

[5] The data are given as at September 2018. See also http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=activesubstance.selection&language=EN.

Figure 3. Number of active substances of pesticides registered in the pesticide database of the European Union



Source: National Audit Office on the basis of EU data

Did you know that

The report of the special committee PEST of the European Parliament highlighted, among others, that we do not have adequate information on the developmental neurotoxicity of the active substances of pesticides, which may cause autism, activity and attention disorders, dyslexia, etc.

There is also no information on the full effect of pesticides on the health of people and animals, and on the environment. The long-term effects and interaction with other chemicals of pesticides has not been assessed upon the authorisation of pesticides.

Source: Report on the Union's authorisation procedure for pesticides (2018/2153(INI)), http://www.europarl.europa.eu/doceo/document/A-8-2018-0475_EN.pdf

Did you know that

maximum levels have also been established for the active substances of pesticides that have not been authorised, i.e. that are banned, as their presence in food cannot be ruled out. The Committee may have banned the use of substances, but their use may still be permitted in Member States (due to transition periods), or the substances are used in third countries. For example, iprodione is a banned substance because of it carcinogenic effect, genotoxicity and reproductive toxicity, but some foodstuffs may still contain it. For example, the MRL for strawberries, where this substance has often been found in the past, is 20 mg/kg at the time of the audit.

9. Chemicals, incl. pesticides, are used by the principle that they should not damage human health or the environment[6]. Various limits have been agreed for the quantities in which pesticides may be used, how much residues may be left in food and how much of such food people may eat.

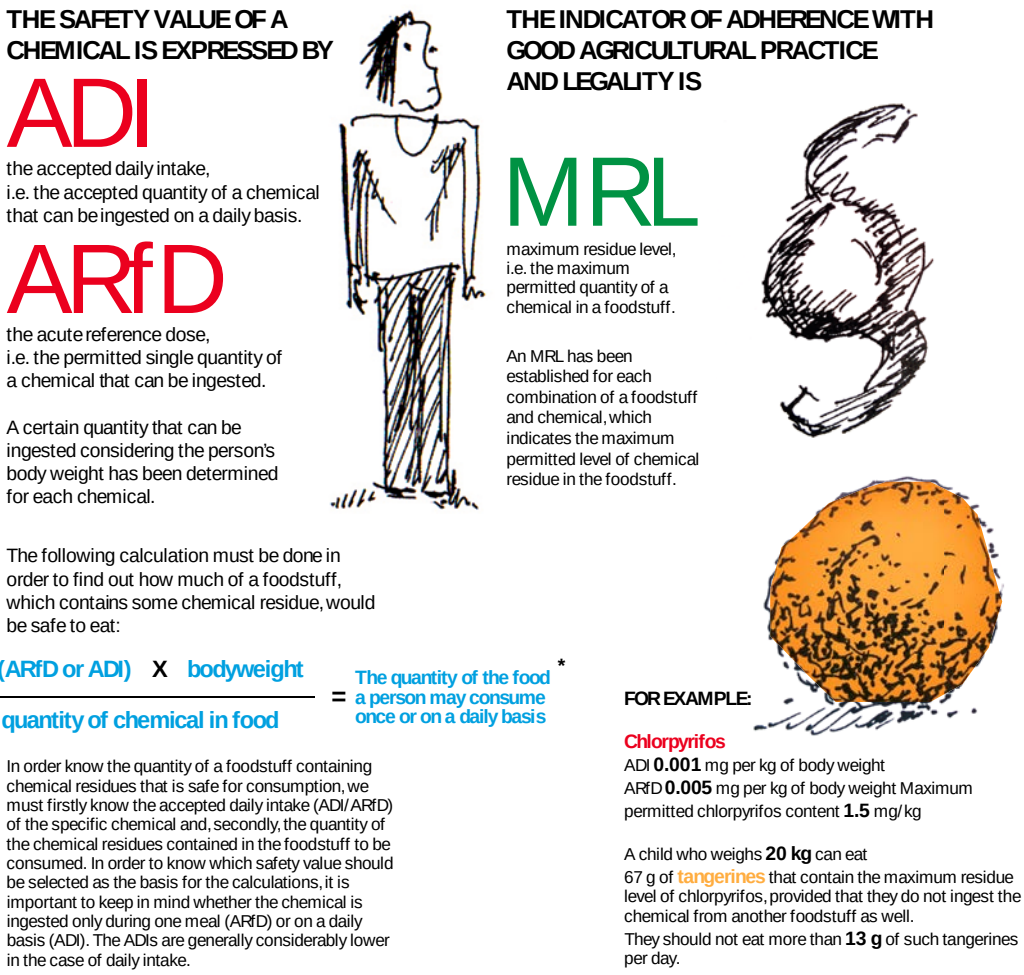
10. In order to guarantee safety, a certain quantity has been determined for each active substance, which may be ingested by a human once or on a daily basis without it causing damage to heath. The other indicator is the maximum residue level (MRL) established for the active substance of a pesticide, which marks the maximum permitted quantity of active substance residue in food if the food has been grown according to good agricultural practice (see Figure 4).

11. In the European Union, safety thresholds and MRLs have been established for almost all chemicals used as active substances of pesticides either in the European Union or in third countries, incl. active substances that are not authorised. The European Commission establishes the MRLs on the basis of the proposals made by the European Food Safety Authority.

12. An MRL has been established for all combinations of a chemical and a foodstuff (378 different foodstuffs) separately and the permitted quantity of a chemical in foodstuffs may differ by thousands of units. For example, a peach may contain 0.02 mg/kg of the plant growth regulator mepiquat, but sunflower seeds 40 mg/kg. There may be 0.05 mg/kg of dithiocarbamates in raspberries, but strawberries are deemed to comply with requirements if the content of these substances does not exceed 10 mg/kg. Apples may contain 0.01 mg of the neurotoxin chlorpyrifos, but celery up to 5 mg/kg. Beetroot may contain 0.1 mg/kg of glyphosate, but oats 20 mg/kg and so on.

[6] Regulation (EC) No 1107/2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market.

Figure 4. Safety thresholds and MRLs of active substances of pesticides (chemicals)



*** The given formulae is the principal calculation on how much of a particular chemical a person can consume considering their bodyweight. There are different formulae being used by different countries and institutions.**

Food safety rules of the European Union and unclear areas in the system

13. A broad discussion of authorisation of the chemicals contained in pesticides, their hazardousness, the establishment of MRLs, protection of human health and the problems associated with growing food is currently ongoing at the level of the European Union and between scientists of different countries. Therefore, it cannot be ruled out that food safety rules will be changed in the future. The discussions have led to the disclosure of a lot of information that should interest both informed consumers as well as officials engaged in food safety (see more in Annex B).

Organic production type – system for growing and production of foodstuffs, which combines the best environmentally friendly practices, biological diversity, preservation of natural resources and guaranteeing animal welfare. This production type is aimed at producing a wide variety of foods and other agricultural products that respond to consumers' demand for goods produced by the use of processes that do not harm the environment, human health, plant health or animal health and welfare.

Source: Council Regulation (EC) No 834/2007 on organic production and labelling of organic products

The safety of the food consumed in Estonia has not been adequately proven

Risks related to food

14. The National Audit Office presumes that all sources of hazards have been identified and all hazards have been minimised in the food

production chain (both conventional and organic production) and handling, i.e. the journey of food from the field to the table.

- The **Ministry of Rural Affairs (MRA)** must divide the functions in its area of administration in such a manner that all of the necessary functions concerning the journey of food from the field to the table are divided and performed. The MRA must have an overview of the contaminants that end up in the food of Estonian people and their quantities as well as whether pesticide residues in food pose a risk to people, which foodstuffs contain these residues, who is at risk and how. If necessary, the MRA must take action to reduce hazards in order to help the state achieve its strategic goal of increasing the healthy life expectancy and have a say in the development of the food safety rules of the EU.
- The **Veterinary and Food Board (VFB)** must analyse the status of food safety in the country, incl. assess in cooperation with the Agricultural Board the risks associated with the growing of food and guarantee that food safety rules are complied with. The VFB must have an overview of the hazards on the Estonian food market (chemicals, their properties, the presence of banned substances, etc.) and the Board must make proposals for amendment of strategy documents or legislative drafting where necessary. The VFB must guarantee that hazardous food does not end up on the tables of people.
- The **Agricultural Board (AB)** must guarantee that pesticides are used according to good agricultural practice in order to prevent, among others, their accumulation in foodstuffs[7]. The AB must have an overview of which pesticides are used and in which quantities, and the Board must guarantee that supervision proceeds from risks

15. The cleanliness and safety of Estonian food are the focal points of the effective Rural Life Development Plan as well as the development plans of agriculture and fishery, which currently exist as drafts and should enter into force as of 2020. The other strategic goals set by the Ministry of Rural Affairs include guaranteeing better export opportunities for Estonian food and creating a competitive advantage via the preservation and promotion of the image of clean food. Enterprise Estonia (EAS) also advertises Estonia as a country where food and the environment are clean (see the picture on the left). Food also has an important role in increasing healthy life expectancy according to the Public Health Development Plan.

16. In the opinion of the National Audit Office, the risks that may arise when Estonian food is grown are not adequately assessed at present. The MRA, FVB or AB have not analysed where, why and in which quantities pesticides are actually used or identified the long-term trends in the contamination of Estonian food with pesticide residues.

17. However, there are indirect references to a possible growth trend: the presence of chemicals in our bodies of water is increasing (pesticide residues were found in both groundwater and surface water from 2012-

Did you know that

The Veterinary and Food Board is responsible for

- control of the food industry, retail trade and wholesale warehouses;
- control of imported food;
- other state supervision.

The **Ministry of Rural Affairs** is responsible for

- the preparation of sectoral strategies and establishment of goals;
- the preparation of legislation;
- the commissioning of scientific research;
- the preparation of the budget of the area.

The **Agricultural Board** is responsible for

- control of Estonian agricultural producers;
- control of the pesticide residues contained in vegetable materials;
- other state supervision.

No information is collected in Estonia about the ways in which food is grown and the risks related to contamination are not on the forefront.

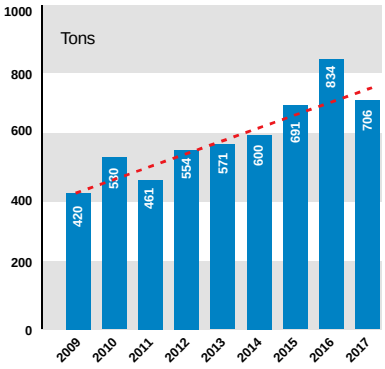
Enterprise Estonia has created videos that introduce Estonia. The picture depicts Taste.Estonia, one of the videos in the Brand Estonia series, where clean food and commitment to growing organic food are named as some of the core values of Estonia.

You can watch the video here: https://vimeo.com/300696685

[7] The AB is also responsible for authorising new pesticides and regularly assessing the existing ones. The National Audit Office did not assess this area in the audit.

2015[8]) and sales of pesticides are also increasing (see the figure next to the paragraph on the next page). The use of pesticides has also increased from 2007-2014, i.e. increasingly larger quantities of pesticides have been used to grow food on one hectare of land[9].

The trend of pesticide sales is an upward one



Source: National Audit Office based on the information of the Statistics Estonia

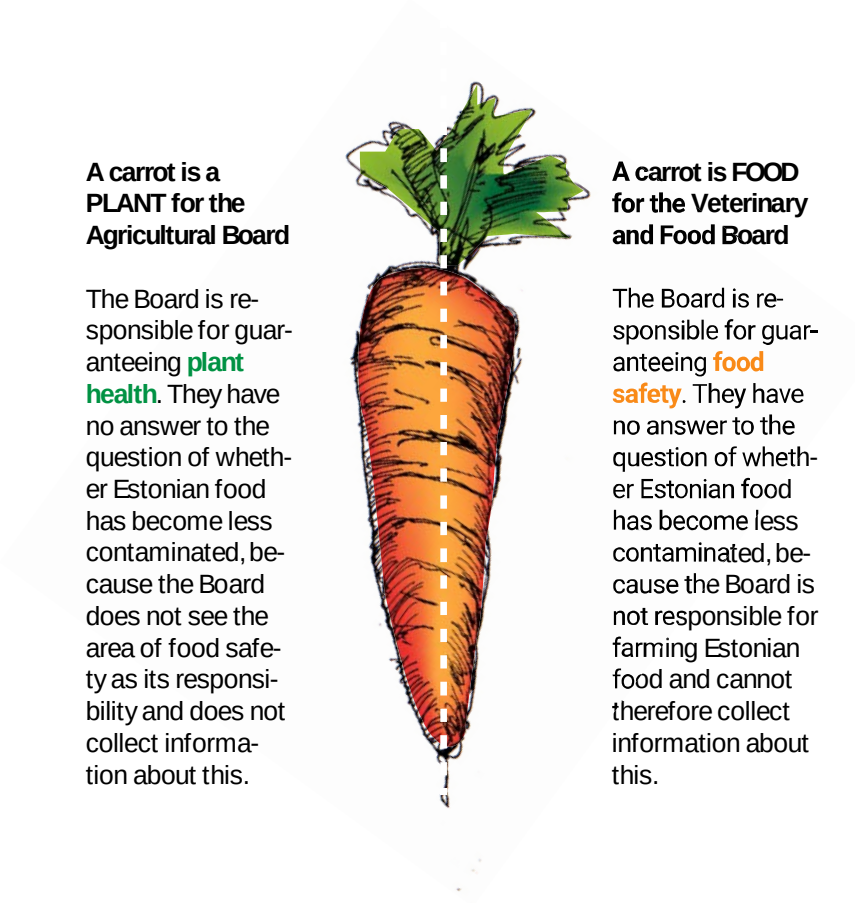
18. The existing data do not allow us to analyse the use of pesticides and fertilisers. The most accurate information about the use of fertilisers and pesticides should be in the field book of the primary producer. This information cannot be generalised at present, as field books are not electronic and data are not collected to a single database. The function of the AB is to inspect compliance with plant health requirements and requirements for plant protection products and equipment proceeding from the Plant Protection Act. This is done via the inspection of field books and other actions, but no generalisations are made on the basis of the data.

19. The AB explained that they are not obliged to generalise the data concerning food, as the Board is not responsible for food safety. The AB sends some of the results obtained from testing plant samples to the VFB, but that's where its obligations end. The VFB, which is the authority responsible for food safety pursuant to law, doesn't have information on which pesticides have been used and on which plants. Thus, it's impossible for the VFB to plan its supervision activities in the best possible manner. As a result of this, it may happen that the residues of active substances of pesticides (e.g. glyphosates) are not analysed in the food likely to contain the highest quantities of these substances because of how it is grown (see also points 58-60).

[8] Monitoring of Nitrate Vulnerable Groundwater 2016. Environmental Research Centre.

[9] http://pmk.agri.ee/mak/wp-content/uploads/sites/2/2017/01/Pestitsiidide-kasutuskoormus-2015.pdf

Figure 5. A carrot means different things to the authorities



Source: National Audit Office

20. Representatives of the MRA also conceded that they don't have all the basic information they need for making decisions about food safety and assessing broader risks. If the use of pesticides and fertilisers is not associated with guaranteeing food safety, the necessary information is not collected and the situation is not analysed, then it's impossible to identify the risks to human health that may arise should the increased use of pesticides become evident in their higher content in food. Also, there is no reassurance about the cleanliness of Estonian food in the future.

The risks associated with the accumulation of pesticide residues in the body are not assessed

21. In order to carry out risk assessments and analyse people's food intake, it is necessary to know who eats what and how much. A dietary study of Estonian people was carried out in 2014[10], which is the necessary source material. The study indicated, for example, that an average Estonian consumes a lot of processed meat products (e.g. sausages), which usually contain nitrites as preservatives.

22. Based on this, the MRA commissioned a study of the quantities of nitrites ingested by people from processed meat products. The objective was to identify the population groups that may be at risk of overconsumption of nitrites. Small children may also be at risk if they eat vegetables and vegetable purées that contain large quantities of nitrates in addition to meat products[11]. Nitrates are generally not studied in

[10] Nutritional Study of Population. National Institute for Health Development, 2014.

[11] https://www.agri.ee/sites/default/files/content/uuringud/2016/uuring-2016-nitritid.pdf

vegetables, as maximum nitrate levels have only been established for a few vegetables[12], which means that there is nothing to which the results could be compared.

23. The problem in the opinion of the National Audit Office is that the MRA and the VFB only focus on legal compliance (the MRLs) in relation to pesticide residues and they don't analyse the risks related to the accumulation of residues in the body. They don't analyse which pesticide residues appear most often in food and how many toxic residues end up in the bodies of people via food. They don't analyse whether the amendment of maximum residue levels (MRL) by the EU may cause situations where eating food that contains acceptable quantities of contaminants means that the acceptable daily intake (ADI) is exceeded. Such studies are carried out in other countries, such as the United Kingdom[13].

24. The maximum residue levels of many pesticides are so small compared to the acceptable daily intake that they should be eaten in unusually large quantities in order to put one's health at risk. However, in certain cases it's possible to exceed the acceptable daily intake by consuming rather ordinary quantities. The less a person weighs and the more residues they consume with their food, the more likely it is that the acceptable daily intake will be exceeded.

25. Figure 6 illustrates the changes in the permitted content of two active substances of pesticides over 14 years. Considering the acceptable daily intake of these active substances, the quantity of food containing the maximum level of the active substance that could be safely consumed today is tens of times smaller than before. (See also Annex C, which shows the changes in the acceptable content of pesticide residues and the safety threshold in the last 14 years. The foodstuffs that exceeded the MRLs listed in the report on the lab tests of Estonian food of 2004 have been used for comparison.)

[12] Maximum levels of nitrates have been established for spinach, fresh lettuce, iceberg lettuce, rocket and food for babies and small children with Commission Regulations (EC) No 1881/2006 and (EC) 1258/2011.

[13] UK Report on the pesticide residues monitoring programme: Quarter 3 2018 March 2019. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784337/pesticide-residues-quarter3-2018-report.pdf

Figure 6. An example of how the maximum residue levels (MRL) of pesticides have changed over time and the related acceptable daily intake (ADI) of food for a child weighing 20 kg

TEBUCONAZOLE

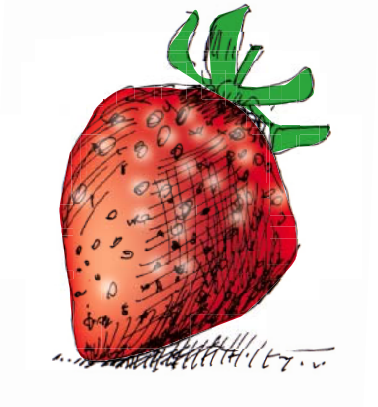
2004	2018
MRL **0.01** mg/kg ADI 0.03 mg per kg of body weight	MRL **0.9** mg/kg ADI 0.03 mg per kg of body weight

In 2004, if tomatoes contained the maximum residue level (MRL) of tebuconazole, the accepted daily intake of such tomatoes was **60** kg per day.

In 2018, if tomatoes contained the maximum residue level (MRL) of tebuconazole, the accepted daily intake of such tomatoes was **0.666** kg per day.

PENCONAZOLE

2004	2018
MRL **0.05** mg/kg ADI 0.03 mg per kg of body weight	MRL **0.5** mg/kg ADI 0.03 mg per kg of body weight



In 2004, if strawberries contained the maximum residue level (MRL) of penconazole, the accepted daily intake of such tomatoes was **12** kg per day.

In 2018, if strawberries contained the maximum residue level (MRL) of penconazole, the accepted daily intake of such tomatoes was **1.2** kg per day.

Source: National Audit Office

Did you know that

The Special Committee on EU authorisation procedure for pesticides (PEST) of the European Parliament invited the European Food Safety Authority, the European Commission and all Member States **to give people information about the risks related to pesticides in an easily understandable manner.**

It also advises the European Commission to carry out an epidemiological **study of actual effect on human health.**

Source: http://www.europarl.europa.eu/doceo/document/A-8-2018-0475_ET.pdf

26. The MRA and the VFB explained to the National Audit Office that the EU has always established all maximum levels with an adequate safety margin and there is no hazard to human health even if the maximum levels are exceeded by several times for as long as the acute reference dose (ARfD) is not exceeded. As the MRA claims that the risk is small, there is no need to assess the accumulation of pesticide residues in the body. At the same time, not a single study about this has been carried out in respect of Estonian people and the quantities consumed over a longer period of time (ADI) have also not been considered.

27. The National Audit Office points out that since the MRA and the VFB don't give any attention to what people eat and how much, and how many pesticide residues accumulate in their bodies, it is impossible for them to claim that no consumer groups are at risk. Calculating the accumulation of pesticide residues in the body would allow the MRA to better draw people's attention to the need to eat varied food and, if possible, to consume the food of different producers to minimise the possible effect of pesticides. This aspect becomes particularly important in the case of a poor or extreme diet (e.g. eating a limited selection of foodstuffs over a long period of time).

28. If information is only collected about the instances where the MRLs of active substances of pesticides are exceeded and not about the risks that Estonian people may be exposed to, the MRA will not have enough good information on the basis of which it could have a say in the process of establishing the MRLs of active substances at the level of the EU.

29. One of the reasons why the risks related to the accumulation of pesticide residues in the body are currently not assessed is the opinion of the VFB that its only function is to carry out supervision and it is not obliged to assess risks on a broader scale. Therefore, the VFB does not prepare assessments of food hazards on the basis of the results of the laboratory analyses of food. The National Audit Office sees this as a major flaw in the activities of the VFB, as it's impossible to operate as a competent food safety authority without assessing risks. The failure to assess risks is also evident in the problems that have emerged in guaranteeing the functioning of the rapid alert system for food safety, which will be discussed in points 121-139.

There is no capacity to assess the interaction of pesticide residues

30. On the basis of the information provided by the experts of the University of Life Sciences, the National Audit Office pointed out as long as 10 years ago that the MRA and the VFB are not giving enough attention to the interaction of pesticide residues. Interaction may occur due to substances contained in one foodstuff or the same substances originating from several foodstuffs[14]. At the time, the Minister of Rural Affairs explained in his response that the lack of scientific proof of contaminants and their health effects has prevented Estonia from having a say at the level of the EU.

Did you know that

no MRL has been established regarding the quantity of various pesticide residues that may be present in food. A level like this has been established for soil: the quantity of pesticide residues in soil should not exceed 0.5 mg/kg. Soil is considered contaminated if this limit is exceeded.

31. The situation has not changed since then: the interaction of pesticide residues is a topic that is not dealt with in Estonia, research in this area is not financed and the MRA is still waiting for guidelines from the EFSA, which has been working on the identification of the synergistic effect (substances that strengthen the effect of other substances) of the substances found in pesticides for a long time[15].

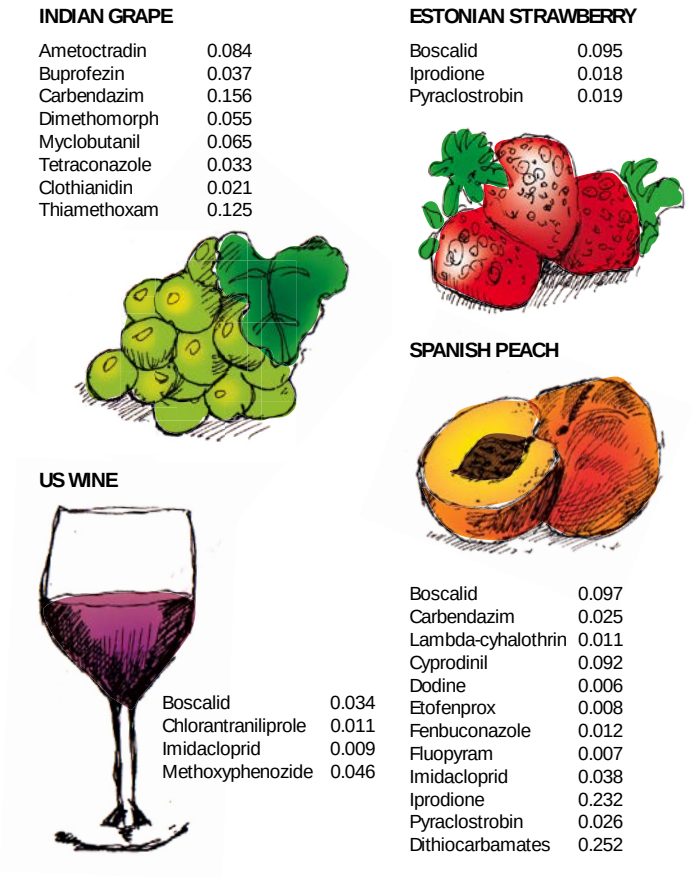
32. The fact that people should at least be informed about possible hazards in this situation is illustrated by the data of the lab tests of food: if residues are found in a foodstuff, then several residues are usually (72%) present. The residues of the active substances of pesticides identified in 2016 are given as examples in Figure 7.

33. As the figure shows, eight pesticide residues were found in imported grapes, 12 in peaches, four in wine and three in Estonian strawberries, each of which did not exceed the MRL on its own. The interaction of these substances is not known and no restrictions have been established on the number of active substances of pesticides that may be present in a foodstuff at the same time.

[14] See the 2009 food safety audit of the National Audit Office and the annex to the audit, i.e. Annex 13 to the expert opinion of the researchers of the Estonian University of Life Sciences. https://www.riigikontroll.ee/tabid/206/Audit/2086/Area/63/language/et-EE/Default.aspx

[15] https://www.efsa.europa.eu/en/topics/topic/chemical-mixtures

Figure 7. Residues of active substances of pesticides identified in wine, peach, strawberry and grape samples in 2016 (mg/kg)



The problems related to the presence of endocrine disrupting chemicals in food are not acknowledged

Endocrine disrupting chemicals (EDC) – substances that disrupt the endocrine balance by behaving like endogenous (originating from within the body) hormones. The ECDs usually have an effect even if their concentration is very small and they are particularly harmful during the critical stages of pregnancy and for small children and teenagers. One of the ways in which people come in contact with these chemicals is via food and drink (pesticide residues, food packaging, etc.).

An estimated 557 billion dollars per year is spent on the treatment of the health damage caused by these chemicals.

Source: http://www.ipes-food.org/_img/upload/files/Health_ExecSummary(1).pdf

34. Various studies[16] and the World Health Organisation (WHO)[17] have drawn attention to the global trends in people's illnesses caused by endocrine disrupting chemicals. There are also references to the connections between the active substances of certain pesticides and illnesses.

35. The increase in obesity, diabetes, cancer, infertility, foetal abnormalities, autism, attention disorders, etc. causes concern. Unborn babies and small children are particularly vulnerable, as even tiny quantities have a permanent effect on the development of their bodies. The aforementioned WHO report indicates that, although scientific information confirms that many pesticides contain endocrine disrupting chemicals, a lot of information is still missing.

36. It's still not clear which criteria should be used to identify the endocrine disrupting properties of chemicals when the authorisation of pesticides is decided. In 2018 the EFSA published a guideline for identification of endocrine disrupting chemicals when the placing of pesticides on the market is decided[18] (see also the EFSA's introductory

[16] http://www.ipes-food.org/_img/upload/files/Health_FullReport(1).pdf
[17] http://www.who.int/ceh/publications/endocrine/en/
[18] https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5311

video about endocrine disrupting substances[19]). This refers to a lack of knowledge about actual safety.

37. According to the laboratory analyses performed by the VFB, dithiocarbamates are the group of substances most frequently found in the food consumed by Estonian people and their MRLs are also the most frequently exceeded. Residues have most often be found in broccoli and cauliflower, but also in apples, tomatoes, peaches, strawberries, cucumber, lemons, pears, grapes, oranges, kiwis and others. The group of dithiocarbamates consists of six chemicals – using some of them is prohibited and some are suspected of having an endocrine disrupting effect[20].

38. According to the VFB, all maximum levels are always established with an adequate safety margin and therefore there is no need to assess the toxicity of the active substances of chemicals or their ability to disrupt the endocrine system. The MRA has not studied and is not planning to study the quantities of the endocrine disruptant pesticide residues that end up on the plates of Estonian people. In the opinion of the MRA, there are no scientists in Estonia who would be capable of carrying out such research and the lack of funds would make it impossible even if someone wanted to study this. The MRA finds that this area should be researched in cooperation with other ministries, because human health is also affected by factors other than food.

39. The Ministry of Social Affairs admits that endocrine disrupting chemicals are an important issue, but as an analysis would be extremely time-consuming and expensive, attention should first be given to the loss of health caused by obesity and unbalanced nutrition. So, there is awareness of the problem, but no action has been planned.

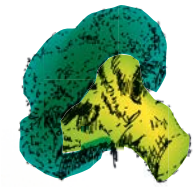
40. One of the recommendations made by the National Audit Office in its audit of 2009 was to establish a working group that would study the results of testing food for pesticides, other contaminants and additives, assess their effect and provide guidelines for the development of further measures. Plant protection, food and medical researchers should participate in the working group alongside the specialists of the MRA and the VFB. Many EU Member States have established risk assessment units as separate agencies or as parts of authorities similar to the VFB in Estonia (Finland[22], Latvia[23], Germany[24], France[25]).

41. No permanent working group of this kind has been established in Estonia and only a few studies of pesticides have been carried out. The MRA has commissioned three food safety studies (about nitrites, caffeine and dioxins in food) and a couple of risk assessments (about raw milk, microbiological factors) in the last eight years[26]. The Estonian University of Life Sciences also provides a service to the MRA, which entails

Did you know that

lab results indicate that
dithiocarbamates (active substance in six pesticides) are constantly identified in broccoli in quantities that exceed the established MRL. According to the VFB, the European Commission has instructed not to measure this substance in broccoli anymore as the MRL is frequently exceeded. The MRLs are reviewed in the EU and it's very likely that they will be increased in the near future.

The specific properties of these six active substances make it impossible for any laboratory to identify which of them was used when the plant was grown, but the result is obtained as the total of all substances.



Did you know that

a state authority has been established in Latvia, which assesses the risks arising from food.

The website BIOR.lv contains research papers that might interest Estonian consumers as well. For example, the heavy metals, pesticides and mycotoxins present in herbs and spices have been assessed[21], the connections between rapeseed farming and the chemicals contained in honey have been sought (in cooperation with the researchers of the Estonian University of Life Sciences), etc.

[19] https://www.efsa.europa.eu/en/topics/topic/endocrine-active-substances
[20] http://ec.europa.eu/environment/chemicals/endocrine/strategy/substances_en.htm
[21] https://www.tandfonline.com/doi/full/10.1080/19393210.2016.1210244
[22] https://www.evira.fi/en/
[23] https://bior.lv/en/research/latest-research?page=1
[24] https://www.bfr.bund.de/en/home.html
[25] https://www.anses.fr/en
[26] https://www.agri.ee/et/uudised-pressiinfo/uuringud/valdkondlikud-uuringud/toiduohutus

provision of independent scientific expert opinions of food and feed safety and other areas.

42. Scientists are also looking for links between human health and food production types. They have found that the consumption of organic food, for example, considerably reduces the accumulation of pesticide residues in the body[27, 28]. The MRA and the VFB see no link between the consumption of organic food and food safety, because in their opinion organic production only concerns environmental protection and establishing a connection between food safety and organic food is not justified.

Conclusions and recommendations made by the National Audit Office

43. In the opinion of the National Audit Office, the MRA and the VFB do not currently collect information about all of the risks associated with food to which attention should be given.

- They don't collect adequate information about the activities of Estonian food farmers: who uses pesticides, which ones and in what quantities. The developments in Estonian food cleanliness are not known. Taking food samples may therefore not be smartly planned.

- It is not analysed whether there are population groups in Estonia that may be vulnerable to the effects of pesticide residues (e.g. vegans because of their one-sided diet, pregnant women, small children because of endocrine disrupting substances, people suffering from chronic illnesses). The focus is on assessing whether the quantity of the active substances of pesticides in food complies with the maximum levels established in the EU and waiting for the positions of the European Food Safety Authority is preferred to making one's own contribution to the establishment of rules.

44. Recommendations of the National Audit Office to the Minister of Rural Affairs:

- In order to ensure an increase in healthy life expectancy and the opportunity to have a say in the development of EU rules, implement the scientific potential of Estonia and develop a system for analysing contaminants, incl. pesticides, that would be based on the actual eating habits of the Estonian people and assess the risks arising from contaminants in food. Also to ensure that the acceptable daily intake (ADI) and acute reference doses (ARfD) are taken into account when pesticide residues and additives are assessed.

Response of the Minister of Rural Affairs: The Ministry of Rural Affairs agrees with the conclusions of the National Audit Office that the volume of risk assessments should be bigger. The Ministry of Rural Affairs has commissioned exposure assessments in respect of some topics (e.g. nitrites in food, exposure to caffeine) or the officials of the Ministry

[27] Quality of Organic vs. Conventional Food and Effects on Health. 2011. https://www.digar.ee/arhiiv/nlib-digar:103784.

[28] Organic diet intervention significantly reduces urinary pesticide levels in U.S. children and adults. 2019 https://www.sciencedirect.com/science/article/pii/S0013935119300246

of Rural Affairs have carried out exposure assessments. The Ministry of Rural Affairs has also entered into a permanent contract with the Estonian University of Life Sciences for the provision of scientific expert opinions and risk assessments and for readiness to provide the above. There are plans to continue with the cooperation and the development of a risk assessment system. The prepared risk assessments and expert opinions are necessary for assessing the food safety situation in Estonia, solving specific problems in the area of food safety and developing the opinions of Estonia in the discussions taking place in the European Union.

We've submitted a request for additional funds for research and development from the budget for 2020. If the request is approved, the Ministry of Rural Affairs is prepared to start creating additional competency for risk assessments and then increase the volume of risk assessments in Estonia.

On average, 15 amendments are made to regulations 1333/2008 and 1334/2008 in the area of flavourings in a year, which change the conditions of their use or expand their use, add or remove substances from the list of substances permitted in the EU. As for pesticide residues, 16 amendments to regulation 396/2005, which concern 93 active substances, have been adopted in recent years. An exposure assessment that considers the consumption habits of Estonian people in all population groups would take at least 100 hours per active substance and the estimated minimal cost of assessing these two areas would be 570,000 euros per year. Also, it may be necessary to assess exposure to existing substances again every year because of changes in eating habits and the practice of using such substances. This means that *ca* 10% of the compounds in the list of permitted substances must be reassessed per year, which means that the budget should be increased by another 600,000 euros. The need to expand surveillance, which again creates the need for extra funds, must also be taken into account in respect of this 10% of substances, i.e. surveillance required 18,000 euros when nitrites were studied.

- Prepare studies in cooperation with the Ministry of Social Affairs to identify the quantity of pesticide residues (incl. endocrine disrupting chemicals) ingested via food and their possible effect on health. Start a biomonitoring to identify the quantity of active substances of pesticides present in people's blood or urine. The data of these studies could also be used for planning actions in the area of public health.

Response of the Minister of Rural Affairs: The Ministry of Rural Affairs shares the opinion of the National Audit Office that biomonitoring would make it possible to assess the exposure of people to various pesticide residues and their health effects. However, it must be kept in mind that this would be extensive research that requires considerable financial resources. A good example is the biomonitoring of micronutrients, which has been pending for years and is intended to cover the research of just five elements, but will cost *ca* 362,000 euros. The lack of scientific data for interpretation of the results is another restrictive factor.

The Ministry of Rural Affairs will consult with Estonian scientists about the feasibility and scope of such research during the first half of 2020. If

the research is feasible, we will submit an additional request for funds from the state budget. We will also consider the need for a preliminary analysis depending on the results of the consultations with scientists.

Food testing in laboratories

45. One way of guaranteeing food safety is to test food for pesticide residues in laboratories. Every year, the European Commission provides a minimum list of foodstuffs and the residues for which they must be tested[29]. Other foodstuffs of contaminants that are important to the state must also be tested.

46. The National Audit Office presumed that in order to check food safety, samples are taken and analysed to an extent that makes it possible to make generalisations about the safety of food and laboratories can determine all significant contaminants, sample-taking is planned on risk-basis, e.g. pesticide residues are studied according to the plants on which they are used. The National Audit Office analysed the reports prepared on the basis of the lab tests of the VFB and the capacity of laboratories to determine residues of pesticides and other contaminants.

Did you know that

- **relatively smaller quantities of pesticide residues have been found in** blackcurrants, milk, onions, barley, swede;
- **larger quantities of residues have been identified in** tea, peaches, pears, grapes, broccoli, oranges, pomelos.

47. The VFB analyses the presence of several contaminants and food additives in food[30]. The VFB studies the content of pesticide residues to the minimum extent set forth by the EU every year. From 2017-2019, for example, it had to study the presence of approximately 180 active substances in 10 foodstuffs[31]. They also have to take samples proceeding from Estonia's own needs.

48. The quantity of samples taken in Estonia has been more or less the same in the last 10 years: 365 food samples were taken in 2007 and 337 samples of 42 different foodstuffs were taken in 2016[32]. The VFB also includes some samples taken by the AB among food samples, which the AB has taken to check compliance with the requirements for use of pesticides.

49. The reports of the VFB indicate that the number of samples where the residue exceeds the MRL has decreased. MRLs were exceeded in 7.4% of samples in 2007, but in just 1% in 2017 (see Figure 8).

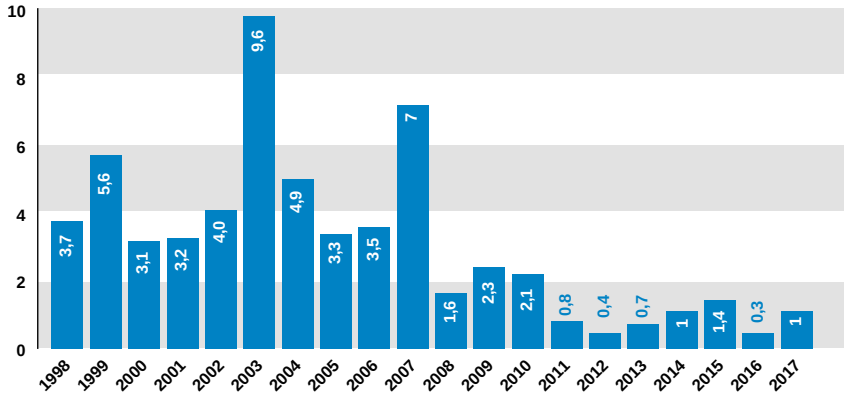
[29] Commission Implementing Regulation (EU) 2016/662 concerning a coordinated multiannual control programme of the Union for 2017, 2018 and 2019.

[30] Studied contaminants – active substances of pesticides, PAHs, mycotoxins, nitrates, heavy metals and microbiological contaminants.

[31] In 2017, for example, the VFB was obliged to test oranges, pears, kiwis, cauliflower, onions, carrots, potatoes, dried beans, rye and rice.

[32] The number of food samples is different in different parts of this audit report, as the number of samples noted by the VFB in the reports of 337 lab tests is not the same as in the data sent to the National Audit Office, where the total number of lab tests given was 349. The VFB could not explain the differences.

Figure 8. Excess MRLs of active substances of pesticides in lab samples of food from 1998-2017 (%)

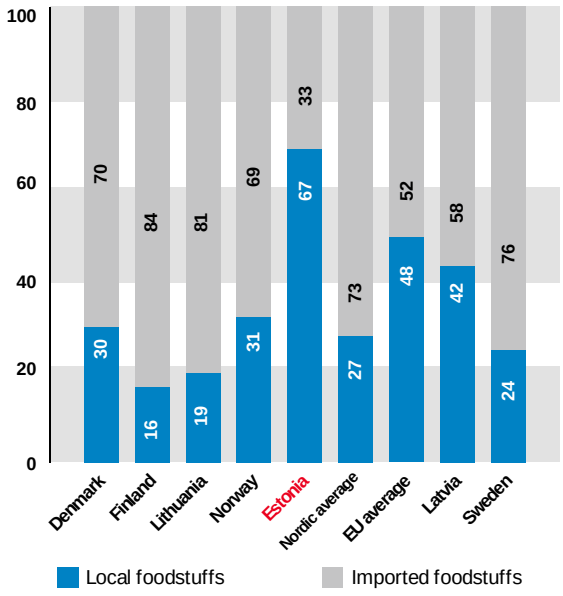


Source: National Audit Office on the basis of the monitoring reports of Veterinary and Food Board

The share of food produced in Estonia, incl. organic products, in lab tests distorts the generalisations made about the Estonian food basket

50. In the opinion of the National Audit Office, the decrease in findings that exceed the MRL is influenced by the manner in which results are presented. Firstly, the share of local foodstuffs and organically grown products among lab tests is large. This has a significant impact on the overall picture of the cleanliness of the food sold in Estonia, because Estonian fruits and vegetables usually contain two to three times fewer pesticide residues than, for example, products imported from Western or Southern Europe. Thus, our closest neighbours Latvia, Lithuania and the Nordic countries took, on average, 27% of samples from their local produce in 2016 whilst in Estonia, 67% of samples were taken from food grown or prepared here (see Figure 9).

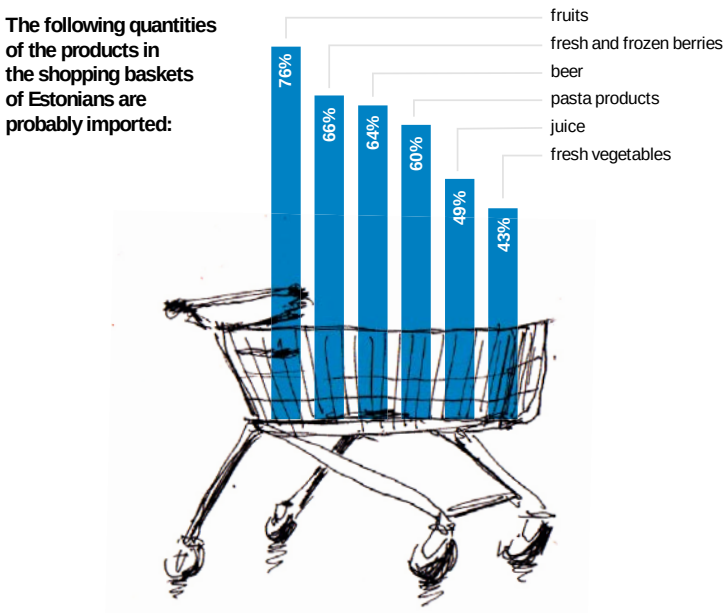
Figure 9. Share (%) of samples taken from local and imported food in Estonia and other European Union countries in 2016



Source: National Audit Office on the basis of the reports of the European Food Safety Authority

51. In the report on food analyses presented by the VFB, the proportion of imported and local food samples does not correspond to actual consumption. The survey organised by the Estonian Institute of Economic Research[33] indicated that local origin is important to Estonian consumers, but they still buy more imported fresh fruits, fish and pasta products (see Figure 10).

Figure 10. Probable share of imported food in the shopping baskets of Estonian people



Source: National Audit Office on the basis of the reports of the Estonian Institute of Economic Research

52. A Commission Regulation[34] requires that a certain quantity of samples be taken from organic products, the number of which reflects their market share in the Member State. As the value of the total production of organic agricultural companies comprised 9% of the total production of the agricultural sector in Estonia in 2016, the number of organic samples that corresponds to this share is 31. 94 organic product samples, i.e. three times as many, were included among food samples. The number of organic samples included among food samples in 2015 was also three times higher. However, the number of organic products in the total volume of samples was under-represented before 2015. For example, 22 organic samples could have been included among food analyses in 2014, but the number included was 12.

53. It must be emphasised that the National Audit Office does not find it necessary to reduce the overall number of organic samples, but the

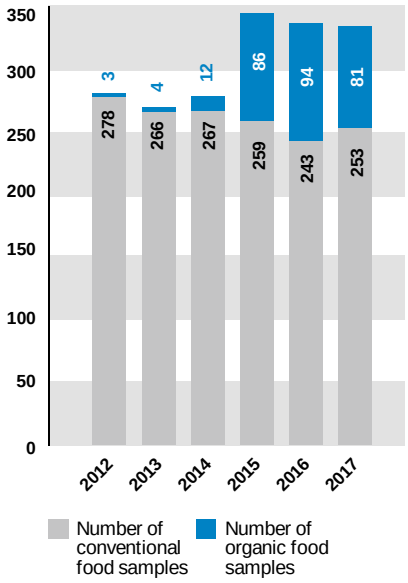
[33] https://www.agri.ee/sites/default/files/content/uuringud/uuring-2018-ostueelistused.pdf (p 2.3).

[34] Commission Implementing Regulation (EU) 2017/660 concerning a coordinated multiannual control programme of the Union for 2018, 2019 and 2020 to ensure compliance with maximum residue levels of pesticides and to assess the exposure of consumers to pesticide residues in and on food of plant and animal origin. See Annex II.

proportions of conventional and organic samples should be followed in the sample of food samples submitted to the European Commission.

54. The number of organic samples is bigger, because the VFB also takes the samples of the AB into account when reporting to the EU and making generalisations about food analyses. The AB analyses organic fruits and vegetables in order to check that prohibited pesticides are not used in production and that the activities of the organic producer comply with the conditions of the organic production support paid by the state. The test results of organic products are better, as expected, because the synthetic pesticides used in conventional production are prohibited in organic production[35].

Figure 11. Total number of samples taken from conventional and organic food



Source: National Audit Office on the basis of the monitoring reports of Veterinary and Food Board

55. According to the VFB, the test results of the samples taken by the VFB and the AB are put together in order to save money. The AB takes samples from plants growing in Estonia and gives information about the first stage of food production by doing the respective analyses. The VFB orders samples in respect of the remaining chain of food production.

56. In the opinion of the National Audit Office, the percentage of consumption of imported and local (incl. organic) food should also be followed when statistical generalisations are made about the lab analyses of the two agencies, and it must be guaranteed that the foodstuffs consumed by Estonian people are assessed to a proportionate extent.

57. The data processing methodology used by the VFB also affects the statistical indicators of food cleanliness. According to this, 50% is subtracted from the lab results of pesticide residues before they are compared with the MRLs. In the opinion of the VFB, the food test results

[35] However, pesticide residues were found in five organic samples in 2016. On two occasions, the residues were found in rye grains and the other cases concerned rapeseed, broccoli and wine.

that exceed the MRL even after half of the value has been subtracted are the only ones that don't comply with requirements. (See more from point 109 onwards.) Such data processing by the VFB makes the test results look cleaner that they are according to lab data. This is an important change to the methodology that must be taken into account upon the assessment of the contamination of food by years.

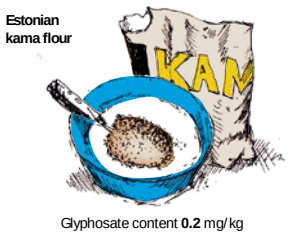
Very little information is collected about the prohibited substances contained in pesticides and the existing test results are extended to all of the analysed food.

58. Not all of the pesticide residue tests that Estonian laboratories can conduct are ordered from them. Two laboratories – the Tartu laboratory of the Health Board and the laboratory of the Agricultural Research Centre – can analyse 455 active substances between them. 349 food samples were taken in 2016, but 378 active substances were analysed in only 18% of the samples. The presence of 51 active substances was analysed only in 10 samples, i.e. in 2.8% of all samples. Many of these substances are prohibited on the market because of the hazards associated with them and should therefore be given special attention, but they have not been analysed.

59. The presence of active substances that are used the most and frequently found in food have not been studied much either (see Figure 12). For example, glyphosate, which has been marketed the most according to Statistics Estonia, has only been studied in a few foodstuffs (strawberries, potatoes, apples, beans and rye). Barley, oat, wheat, rapeseed, etc. have not been analysed, even though it's known that this substance is widely used when these plants are grown. In the opinion of the scientists of the University of Life Sciences, glyphosates are used a lot and especially in cereals, and they find that the quantity of glyphosate analyses should be increased[36, 37].

[36] Audit of the National Audit Office "Activities of the state in guaranteeing the safety of foodstuffs of vegetable origin". Annex: Expert opinion of the University of Life Sciences 2009.

[37] Letter of the scientists of the University of Life Sciences of 5 September 2018 to the Ministry of Rural Affairs (document register of the MRA).



Glyphosate content **0.2** mg/kg

Residues of glyphosate, an active substance of pesticides, were also identified in Estonian kama flour (a mixture of roasted barley, rye, oat and pea flour) in the food samples ordered by the National Audit Office. The presence of this active substance in the food consumed by Estonian people is minimally analysed.

A maximum residue level (MRL) of active ingredients of pesticides has been established separately for each ingredient of kama. The MRLs of glyphosate are as followed: wheat and rye 10 mg/kg, barley and oat 20 mg/kg, peas (without pods) 0.1 mg/kg. No maximum level has been established for the total residues contained in kama flour.

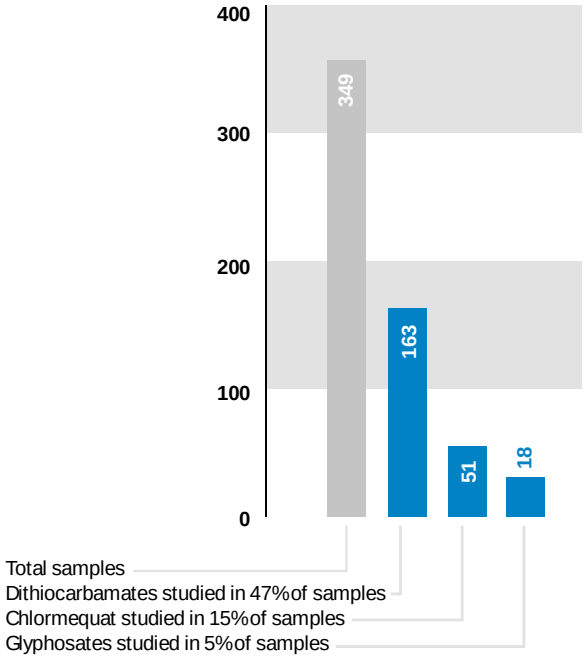
Ethoxyquin – both an active substance of pesticides (fungicide and plant growth regulator) and an additive (E324), which has been used as an antioxidant in food and (fish) feed. It is now prohibited because of its harmful effects (however, a transition period has been granted until 2020). The VFB does not test food samples for this substance.

DDT – a toxic chemical (dichlorodiphenyltrichloroethane) invented in 1948, which was extensively used as an insecticide at home and in fields. The inventor of the substance was awarded the Nobel Prize. The toxicity of the substance became evident years later after a sudden increase in the birth of children with abnormalities. This substance has been banned in developed countries for about 20 years. The substance accumulates in the ecosystem and the fatty tissue of animals and people. DDT is a neurotoxin and disrupts the endocrine system.

Linuron – a substance the use of which in pesticides is prohibited cause of their endocrine disrupting properties.

Additives are very rarely tested

Figure 12. Studies of the active substances of pesticides most used and identified in food samples in 2016



Source: National Audit Office on the basis of the monitoring data of Veterinary and Food Board

60. The results of a few tests have been presented in the generalising report of the VFB in a manner that makes the impression that all analysed samples were tested for all active substances of pesticides. The VFB explained that in their opinion, there is no need to test other foodstuffs for residues, as they would probably not be found in these foodstuffs. In the opinion of the National Audit Office, there are no grounds for the VFB to claim that a foodstuff doesn't contain an active substance for which it was not tested. (See the information about the frequency of substances in points 114-116.)

61. During the audit, the National Audit Office ordered the analysis of nine food samples from the Tartu laboratory of the Health Board to assess the possible presence of residues of active ingredients of pesticides in them. The analyses indicated that 66% of the analysed foodstuffs contained residues and each of them contained the residues of one to three active substances (see Annex E). If we base the assessment of active substances without MRLs on the established default level of 0.01 mg/kg, then the residue of ethoxyquin (in salmon) and DDT (in salmon) exceeded the maximum level. An active ingredient (linuron), which has been banned in Estonia since 3 June 2018, was found in Estonian carrots. The results cannot be generalised because of the small sample, but they suggest the presence and interaction of residues in foodstuffs.

62. Many additives, both natural and synthetic, are used in food processing at present. The VFB takes food samples for the determination of additives, but does it very rarely. 25-35 samples have been taken in recent years: these numbers are so small that the results cannot be generalised and it's impossible to claim on the basis of these samples that food is safe, especially considering the fact that 334 additives are used.

Many e-substances such as emulsifiers, thickening agents, flavourings are either not tested or cannot be determined in Estonia (antioxidants, stabilisers, certain preservatives).

The small number of tests impedes the development of Estonian laboratories

63. The accessibility of laboratory services and the possibilities for analysing contaminants were also reviewed during the audit. The VFB mainly uses the services of the Health Board, the Veterinary and Food Laboratory and the Agricultural Research Centre when testing food samples.

64. The capacity to determine pesticides has been more or less equally developed in the Tartu laboratory of the Health Board and the Agricultural Research Centre: the first can determine the residues of *ca* 350 active substances and the other *ca* 380. The Tartu laboratory of the Health Board can determine other substances, such as food additives, PAHs, etc. The Veterinary and Food Laboratory specialises in testing animal products and food additives are also determined.

65. In 2017 the Ministry of Finance commissioned a study to obtain an overview of the activities of the laboratories[38]. A recommendation made as a result of the study was to agree at the level of state which national laboratories will conduct tests in which areas in order to avoid duplication.

66. The study recommended weighing two options for information exchange: to establish a cross-laboratory database that includes all of the tests done by national laboratories with the necessary indicators; or if such a database is not established, a system for extraordinary queries should be established which could primarily be used by supervisory authorities to order tests not included in supervision or testing plans and through which the suitable laboratory can accept the order. The MRA has not implemented the recommendations made in the study yet.

67. Estonian laboratories are currently unable to determine various pharmaceutical residues, growth promoters, toxins. Laboratories have to reorganise their work in order to conduct various analyses, procure equipment if necessary or send samples to other laboratories. It is also possible to use the services of accredited foreign laboratories. For example, tests of samples of dioxins and substances similar to dioxins are ordered from the laboratories of other countries, because Estonia does not have a laboratory authorised to conduct such tests.

68. The state orders relatively few tests from laboratories. For example, orders for tests of pesticide residues divide between the Agricultural Research Centre and the Tartu laboratory of the Health Board. If the number of orders is small, it means that the expensive equipment is underused and the laboratories do not earn enough money by themselves in order to invest in the renewal of equipment.

Conclusions and recommendations made by the National Audit Office

69. In summary, the following conclusions can be made:

- Making laboratory tests in the quantities prescribed by the EU alone does not guarantee an overview that is good enough for making generalisations about the safety of Estonian food.

[38] Analysis of optimisation of the activities of national laboratories. AS Civitta, 2018.

Statistical generalisations are made on the basis of the test results, but the weights corresponding to market shares are not considered when they are presented.

- On the one hand, the VFB makes generalisations on the basis of inadequate data and on the other hand, the share of samples where the tested food (Estonian food, incl. organic) is the kind of food that contains less pesticide residues or none at all is disproportionately large. At the same time, the majority of the food in people's daily food baskets (fruits, berries) is imported. That's how the overall picture of food looks cleaner.

- The capacity of Estonian laboratories to analyse pesticide residues has improved in comparison with the previous audit and they can determine the residues of most pesticides placed on the Estonian market. However, the capacity of laboratories to invest in the renewal of their equipment is not guaranteed.

70. **Recommendation of the National Audit Office to the Minister of Rural Affairs:** agree on in areas and laboratories in which tests are conducted in order to reduce duplication of the activities of laboratories (e.g. in the determination of pesticide residues).

Response of the Minister of Rural Affairs: The analysis of "Commissioning of an analysis of optimisation of the activities of national laboratories for the Ministry of Finance" was carried out on the order to the Ministry of Finance (2017/2018). A council was formed in 2018 of the representatives of the Ministry of Education and Research, Ministry of Justice, Ministry of the Environment, Ministry of Rural Affairs, Ministry of Economic Affairs and Communications and Ministry of Social Affairs in consideration of the analysis in order to guarantee that the activities of national laboratories are optimised and any issues related to the laboratories are resolved. Finding consolidation options in three areas (microbiology of food, quality of water and geology) started in 2018 and the analysis of increasing the efficiency of laboratory services will continue.

71. **Recommendations of the National Audit Office to the Director General of the Veterinary and Food Board:**

- In addition to the food tests prescribed in the EU, extend the selection of the foodstuffs tested in laboratories considering the kind of food that people consume the most as well as food in which pesticide or other contaminant resides are more likely to be found.

- Tests of organic food should be added to reports according to the recommendation of the European Commission that the number of these tests in the total should not exceed the share of organic food on the food market.

- More tests of additives in food should be ordered and the capacity of a laboratory to determine all of the most significant additives should be developed.

- All active substances should be tested at statistically correct weights in order to obtain information about the actual frequency of pesticide residues in the food sold in Estonia. If surveillance is not carried out in the correct proportions, it should be based on which pesticides are used the most and on which crops.

Response of the Director General of the Veterinary and Food Board: In 2019 the Veterinary and Food Board extended the monitoring of pesticide residues and other contaminants to the extent of the additional budget and is planning to extend the monitoring even further if continued financing is received, taking into account the monitoring recommendations of the European Commission and the supervisory priorities of the VFB. The goal after the analysis of the complete service of food safety is to map and list the sources of information that must be taken into account when supervision is planned (incl. when monitoring is planned) and to determine the criteria of how such information is to be used when supervisory priorities are set.

Samples of organic food are taken by two agencies (the VFB and the AB) in the volume stipulated by law, but in order to ensure that the shares of organic and conventional food samples are statistically proportionate, it would be necessary to increase the number of conventional food samples by at least 300, which would require an additional 120,000 euros per year.

The VFB is planning to change the planning of additive samples by updating the risk criteria that are the basis for monitoring plans. In the case of additional funding, the VFB would be able to order tests of more samples from laboratories and have more additives tested.

The VFB finds it necessary to have access to the information that indicates the crops on which and the quantities in which pesticides are used in Estonia by primary producers in order to be able to plan risk-based supervision. In addition to the local information about the pesticides used in Estonia and the crops on which they are used, it is also necessary to have international information, as the VFB also controls food that does not originate from Estonia in addition to food that does originate from Estonia. Obtaining such information requires the establishment of an international register that would contain the data of all Member States. No such database exists at present.

The VFB has determined the highest-risk food and producer groups, but doesn't have the capacity to control them all

Supervision of food producers and sellers

72. Food producers and food business operators are obliged to guarantee the safety of food above all. In order to guarantee food safety, they must take measures and describe them in the own control plan, which forms their own control system. Following this plan allows the producer and the operator to issue a certificate about the quality of food, which is the documentary output of food safety that the buyer of food can rely on. The VFB must check whether food business operators comply with the requirements of own control.

Food certificate – a declaration of conformity proving the compliance of food with requirements or the document issued by the producer or manufacturer of the food in which they confirm that the food complies with the requirements of legislation.

73. The National Audit Office assessed whether food controls are based on risk assessment, whether all areas are covered by assessment, whether the own control plans of operators have been prepared and are complied with, and whether controls are performed as frequently as required. The

multiannual national control plan, the action plans of the VFB and the data of the supervision information system of the VFB were used as the basis.

74. The audit revealed that the VFB has determined the areas (e.g. retail trade, food service, transport) in which and the reasons why guaranteeing food safety presents the highest risk. The VFB has planned activities for reducing these risks (with the persons responsible and deadlines). As the supervision and control activities differ by areas, the VFB has approved risk management grounds separately for each area.

75. The risk-based approach allows competent authorities to allocate more funds to the areas where the risks are higher. For example, control visits to medium- and high-risk retail and food service companies are made at least once a year (for example, stores visited by more than 250 buyer per day are considered medium-risk companies).

76. The VFB has prepared the integrated multiannual national control plan (MANCP) required with EU regulations[39, 40]. It includes general information about the structure and organisation of control systems. The strategic goals of control, the risks related to the relevant activities, related agencies, the procedure for performance and management of controls have been set out in the plan.

77. Approximately 15,000 food business operators were supervised by the VFB in 2017. In addition to them, the Board also gave attention to a couple of thousand inactive operators, some of which may only have discontinued their operations temporarily. The VFB planned to perform 11,824 controls in 2017, but it actually performed 10,112 controls, i.e. 86% of the plan. The average frequency of controls per company per year was 0.8 times (also 0.8 times in 2016). Unscheduled controls were also performed (solution of identified problems, processing of hints).

78. An analysis of sectoral control plans revealed that 13% of companies in food service, incl. 15% of high-risk companies, were not controlled in 2017; the same figures in retail sale were 18% and 15% and in wholesale 22% and 9%, respectively. The reason why controls were not performed was usually the fact that the company had stopped operating or changed its area of activity. The large work load of supervising officials or incorrect planning of functions were also partly the reasons (see Figure 13).

Did you know that

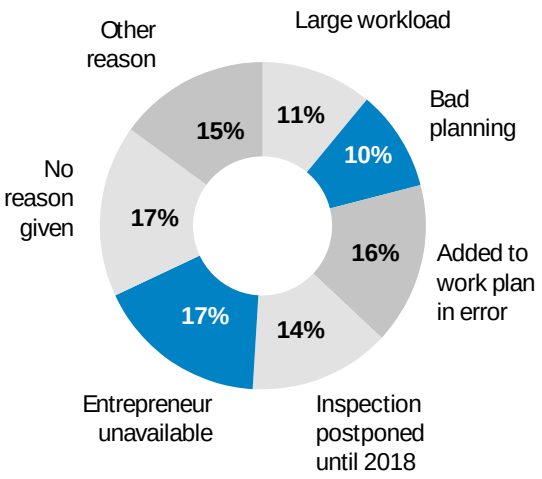
the number of companies engaged in organic farming, manufacturing of food in private houses, handling of food of non-animal origin and combined food and wholesale is increasing the most.

16,524 precepts in total were issued to companies in the food control system in 2017 (the average number of precepts per year was 1.1 per company and 1.4 per control). The number of precepts has decreased by *ca* 11% in comparison with 2016. Five misdemeanours were processed on the basis of the Food Act and the fines imposed totalled 3,450 euros (two misdemeanours and 380 euros in 2016).

[39] Regulation (EC) No 882/2004 of the European Parliament and of the Council on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.

[40] Regulation (EU) 2017/625 of the European Parliament and of the Council on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products.

Figure 13. Reasons for not controlling foodstuffs in retail sale in 2017



Source: National Audit Office on the basis of the data of Veterinary and Food Board

79. The VFB explained that the number of employees in county centres decreased by 10% from 2012-2015, but the number of companies that must be controlled has increased by 7% a year on average in the last three years. 3.5 million euros in the budget of the VFB has been allocated to activities related to food supervision and this amount has remained the same in the last three years. In the opinion of the VFB, the current status may result in a situation where the Board will be unable to perform the constantly added functions[41].

80. According to the new control regulation of the EU adopted in 2017[42], it is necessary to guarantee that a competent authority has a sufficient number of experienced employees with suitable qualifications, that these employees have appropriate conditions and that official control and other activities can be performed efficiently and effectively.

81. The control reports of the VFB reveal that almost all companies had prepared own control plans in 2017, but requirements were ignored by a third of food business operators. The VFB mainly issued precepts to companies because their premises and equipment did not comply with requirements or they failed to comply with general hygiene requirements. Problems were also found in food labelling and identification of the country of origin. The deficiencies had mostly been eliminated by the time of follow-up controls. This indicates that controls are effective: precepts have been justified and improving the situation is manageable for operators. This also indicates that own control works more efficiently alongside the supervision carried out by the VFB.

[41] Additional application for costs of VFB 2018-2021, state budget for 2018.

[42] Regulation (EU) 2017/625 of the European Parliament and of the Council on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products.

Operators give too little attention to the identification of contaminant content in food during own control

82. Food that is sold must not contain excessive quantities of contaminants or pathogens. Food business operators determine the frequency of taking samples on the basis of risk analyses and a procedure based on good hygiene practices, considering the use of the foodstuff. The samples taken in the course of own control are tested by operators in the laboratories belonging to them, or select the laboratories of third parties that include VFB authorised laboratories or other private laboratories.

83. As the service of contaminant determination is relatively expensive (e.g. a so-called full analysis of pesticides[43] costs *ca* 500 euros), the operators that handle food of plant origin don't usually order them and try to guarantee the quality of food solely be following technologically correct methods, as set out in the own control plan. However, the quantity of contaminants (and pesticide residues in particular) in food may not depend on the food business operator, because the raw material bought by the operator may contain residues. For example, residues in quantities that exceed the MRLs have even been found in baby food[44].

84. The National Audit Office points out that excessive pesticide residues can only be identified in food with lab tests. If operators do not conduct tests, they pass the obligation to guarantee safety on to the state.

The AB controls the same conventional producer after an interval of several years

85. The risk management principles in the Agricultural Board are very similar to those in the VFB, risk assessment is performed on the basis of the data of the Plant Protection and Fertilisers Department of the AB and obtained from the Agricultural Registers and Information Board in relation to agricultural support. Plans for control activities and sample taking are prepared proceeding from the risks of various areas. The size of the company, the crops grown, previous breaches, new players on the market, producers previously not included in samples and other information at the disposal of the Board are considered upon risk assessment.

86. The AB performed 945 plant protection controls in 2017 (e.g. the field book, the spraying equipment, storage of pesticides). Whilst organic producers must be controlled once a year, the Board manages to control conventional producers once in five to seven years on average. The content of active substances of pesticide residues in plants was checked 99 times in 2017. The number of tests of organically grown food has increased significantly.

87. According to the AB, a larger number of effective controls would've been performed if there was more money, e.g. the AB didn't get more money even in 2015, when it was assigned the additional obligation to control the non-agricultural use of pesticides (e.g. on the edges of roads).

Origin fraud is difficult to identify

88. Organic produce and fruits and vegetables grown in Estonia are often more expensive than conventional produce or imported fruits and vegetables. According to the MRA and the AB, some producers or sellers are interested in earning money by origin fraud and sell cheaper (and

[43] Complex of substances analysed by the multi-method.

[44] Over 0.01 mg/kg of chlormequat was found in baby food produced in Estonia in 2015, which means that the food did not comply with the requirements established for pesticide residues in food for babies and small children.

often more contaminated) produce as organic or Estonian food. The Estonian origin of food is important to consumers, as food grown in Estonia is considered less contaminated and healthier. The possibilities of Estonian producers to remain competitive are damaged as a result of fraud.

89. The audit revealed that the VFB and the AB have the right to inspect the origin fraud related to fresh fruits and vegetables (e.g. strawberries, apples, carrots), but only the VFB or the Consumer Protection and Technical Regulatory Authority can punish the persons who resort to such fraud[45]. The maximum fine the VFB can impose on a legal entity is 2,600 euros, but the fine that can be imposed by the Consumer Protection and Technical Regulatory Authority is 32,000. The latter doesn't actually inspect fraud related to the origin of fruits and vegetables, although the Food Act gives it the right to do this.

90. Origin fraud is difficult to detect, as it may require controlling the entire supply chain and cooperation of several authorities. The function of AB is to check on the basis of the field book and the samples taken from the field or warehouse whether Estonian fresh fruit, vegetable and berry farmers have followed the requirements for use of pesticides. The AB checks the external quality and labelling of the goods on stalls as well as the compliance of the information given with the delivery note. Usually, the AB does not order additional lab tests of the food on stalls, as this is a duty of the VFB.

[45] Pursuant to § 70 of the Consumer Protection Act, for obtaining a trading advantage by misleading consumers.

In 2017 an Estonian apple farmer found apples packaged and marketed at stores that were misrepresented as apples of the Renett variety. It became evident that the apples were not of this variety and the origin of the apples was also not known.

The analysis ordered by the apple farmer revealed that the apples contained residues of six pesticides, one of which (chlorpyrifos) exceeded the established MRL and four of which were banned in Estonia. The residues were not found in the sample officially taken by the VFB.

The AB identified a breach by the same producer in March 2019 as well. The producer sold apples from another country as Estonian apples. The sample of the apples withdrawn from the market was an important piece of evidence when the breach was identified, as it contained residues of pesticides banned in Estonia (but permitted in the southern states of the EU).

Photo: Robin Roots/Õhtuleht/Scanpix Baltics

91. The VFB takes samples of fresh fruits, vegetables and berries from the stalls in shops and mostly from imported goods. One of the preconditions to focusing on the latter is that Estonian goods, which have been placed on the market, have passed controls by the AB. However, if someone who uses fraud sells imported food as Estonian food or mixes Estonian fruits and vegetables with imported ones, the only way to detect the fraud would be by identifying the variety of the product or by taking a laboratory sample of the food in shops.

92. The pesticide residues in the test results would then have to be compared with the field book of the fruit or vegetable farmer indicated in the delivery note of the goods and the list of pesticides permitted in Estonia. It's also possible to check whether the farmer specified in the delivery note has produced such produce at all or in the quantities that are allegedly for sale.

93. In the last year, the VFB and AB cooperated more closely and performed some controls covering the entire supply chain, as a result of which precepts were issued for violations (see the example on the left). However, such controls are not regular and the VFB has not imposed any fines.

94. In the opinion of the National Audit Office, the way functions and rights are divided between the authorities is not helping to prevent or detect fraud efficiently at present. If the producer's goal is to earn income with fraud, the possibility that the AB will issue them a precept will not motivate them to give up the fraud. The only substantive sanction at present is the publication of those who commit breaches and the hope that this will influence the preferences of consumers. The explanations of the AB show that impunity has led to even more blatant fraud.

95. A uniform set of rules has been effective in the EU for guaranteeing food safety. The new control regulation of the EU[46] will enter into force in late 2019 and it will expand the areas of food safety supervision. Whilst the scope of the effective regulation covered food, animal health, animal welfare and feed, the new regulation will also cover controlling the use of pesticides (previously assessment of active substances and placement on the market), food fraud, organic agriculture, etc.

96. In addition to the VFB, the Agricultural Board also has an important role in the performance of the functions arising from the EU regulation. The goal set in the multiannual national control plan of the VFB and the development plan of the area of government of the MRA (2018-2021) is to update the regulation and develop said activities.

The VFB and AB have efficiently developed their information systems

97. The MRA has developed its own information systems and the information systems of its agencies in order to cope with added functions. All of the main data that facilitate supervision are accessible in the Supervision and Information System of the VFB: authorisations and data of the activities of food business operators, entries into the annual plan, raids by the controller, control reports, data of the samples taken in the course of supervision, etc. The AB in its turn uses the supervision

[46] Regulation (EU) 2017/625 of the European Parliament and of the Council on official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products.

information system PMAIS, which was created to support the internal organisation of work of the Board and which includes procedural information, control records, etc. The information management system, import consignment register, plant health register, etc. are currently being perfected.

Recommendation made by the National Audit Office in 2009:
increase the efficiency of internal information exchange, which would recognise the results of the supervision carried out by the veterinary centres of all counties; and perfect the existing test supervision register with more detailed data about the tests for pesticide residues.

98. At present, the PMAS is connected to the laboratory of the Agricultural Research Centre with whom data about pesticide residues are exchanged. The information system of the VFB is compatible with the information system of the Veterinary and Food Laboratory from which the results of sample analyses are received electronically. There is no connection with the laboratories of the Health Board and the AB yet, but its existence could prevent delays in getting the results of lab tests and save some time for officials when entering data in their databases.

99. In the further development of information systems, the MRA has also considered the possibility of granting the inspectors of the VFB access to the supervision database of the AB and vice versa.

100. Information systems help officials use the collected data more efficiently, as it allows them to perform indirect controls, which would reduce the time needed for on-site controls. The lack of a uniform information system – a digital field book – is currently an obstacle to controlling the use of fertilisers and pesticides in plant production. The Ministry is planning to start implementing a digital field book by following the data developments of the private sector in this area (e.g. the e-Agronoom and VitalFields programmes introduced at training days).

Conclusions and recommendations made by the National Audit Office

101. All in all, it can be said that the VFB follows the principle of the EU control regulation. Official controls have been performed regularly and proceeding from the risk assessments of companies. However, supervision capability may start to weaken, because the area of control is expanding and the number of supervision officials is decreasing, which is why performing all of the planned activities is already becoming a problem. An important drawback in the opinion of the National Audit Office is that the risks do not proceed from the information about the kind of plants on which pesticides have been used the most or the producers who have been using them the most. The controls by the VFB and AB are incapable of efficient prevention of fraud related to varieties and origin of fruits and vegetables.

102. **Recommendations of the National Audit Office to the Minister of Rural Affairs:**

- Assess risks in the multiannual national control plan and stipulate measures (incl. taking laboratory samples from the Estonian goods for sale), which would guarantee the systematic detection and reduction of origin fraud in order to protect the interests and competitiveness of local producers, and that products of correct origin reach the consumers.

Response of the Minister of Rural Affairs: The process of development of the multiannual national control plan, which also includes the supervision related to the systematic detection and reduction of origin fraud, was analysed in cooperation with the relevant agencies in the second half of 2018 within the scope of the analysis of the comprehensive

food safety service. The Ministry of Rural Affairs led the process. As a result of this, it was decided to start developing a new concept of a control plan in April 2019 instead of the multiannual national control plan that had been used until then and to start implementing it in 2022. The principles of supervision of origin fraud will also be reviewed during this process.

However, as regards the recommendation to protect the interests and competitiveness of local producers, we have to note that measures for this purpose cannot be stipulated due to the European Union rules for operation of the internal market and competition. The producers of all Member States operating on the internal market of the European Union must be guaranteed equal opportunities for marketing their products. Consumer protection can be the purpose of the measures related to origin requirements. Consumers must be guaranteed correct information about the origin of food, which they can take into account when making choices.

- Create a digital field book to collect information about the actual use of pesticides and fertilisers. This would help plan supervision that is more risk-based and analyse possible breaches without visiting the producers on site. It would also give generalised information about trends in the use of substances.

Response of the Minister of Rural Affairs: Although field books can currently be kept on paper and electronically, larger agricultural producers mainly use electronic field books. For example, it's easier for farmers to observe the history of a field and the supervisory authority to control compliance with requirements and restrictions on the basis of the data entered in an electronic field book. However, field books are kept on paper as well and there are various reasons for this. These reasons must be taken into account when a digital field book is created and solutions must be found for them if possible.

In respect of the transfer to a digital field book, it would also be necessary to assess whether the costs this would bring about for the farmer and the state are proportionate to the benefits of this or whether information about the actual use of pesticides and fertilisers could be obtained in another manner as well.

We add that a long-term knowledge transfer programme has been launched in the area of agricultural big data. One of the objectives of the programme is to promote the use of online IT solutions with the functions of a field book in agricultural companies. The first stage of the programme is currently ongoing and depending on the results of the feasibility study to be carried out, the further objectives of the programme may also include the creation of capability for connecting the state's information systems with said field book solution for data collection purposes.

103. **Recommendation to the Minister of Rural Affairs and the Director General of the Consumer Protection and Technical Regulatory Authority:** In cooperation of the AB, the VFB and the Consumer Protection and Technical Regulatory Authority, find a solution for better detection and processing of fruit and vegetable origin fraud and variety fraud, incl. decide which authority is primarily responsible for the

detection and processing of such fraud. Implement effective sanctions for the prevention of further fraud.

Response of the Minister of Rural Affairs: The principles of supervision of origin and variety fraud are currently based on the provisions of the cooperation agreement between the Agricultural Board and the Veterinary and Food Board. The possibilities of solving the problems related to supervision were partly analysed within the scope of the comprehensive food safety service and possible solutions were also suggested.

We will take the recommendation of the National Audit Office on board and look for solutions to better detection and processing of origin and variety fraud and are considering the implementation of additional sanctions.

Response of the Director General of the Consumer Protection and Technical Regulatory Authority: In response, the CPTRA states than on the basis of the legal regulation specified above, which relates to the marketing standards of fresh fruits and vegetables, the detection of origin and variety fraud concerning fresh fruits and vegetables could be a responsibility of the Agricultural Board, which pursuant to the European Common Agricultural Policy is the competent authority regarding control and supervision of compliance of the marketing standards of fruits and vegetables. The competent authority in the area of assessment of food quality and safety is the Veterinary and Food Board.

In the opinion of the CPTRA, consumers have the right to demand and receive goods that comply with requirements and are safe to the health of consumers. Consumers are entitled to receive the information they need and it must be true to allow them to make informed choices and give them timely information about the risks related to goods. Goods must be offered and marketed in a manner that is honest towards consumers.

Consumers are not given all the information they need

Informing consumers about food hazards

104. The information given to consumers about food hazards must be true and it must clearly indicate which pesticide residues and in which quantities have been tested in laboratories. The generalised information of lab analyses should be presented in a manner that reveals the foodstuffs that contain the most residues, differentiating the origin and production method of the food (i.e. conventional or organic).

105. Consumers must also be given information about the hazards not regulated with MRLs, e.g. the interaction of pesticide residues. It’s also necessary to explain how these residues can affect the health of people and making reassuring claims about the lack of hazards should be avoided. Information must help raise the awareness of consumers, so they can choose food that is as clean as possible. The MRA and the VFB must forward information through the same channels that consumers use when looking for information.

Information is presented in a manner that is of no use to consumers

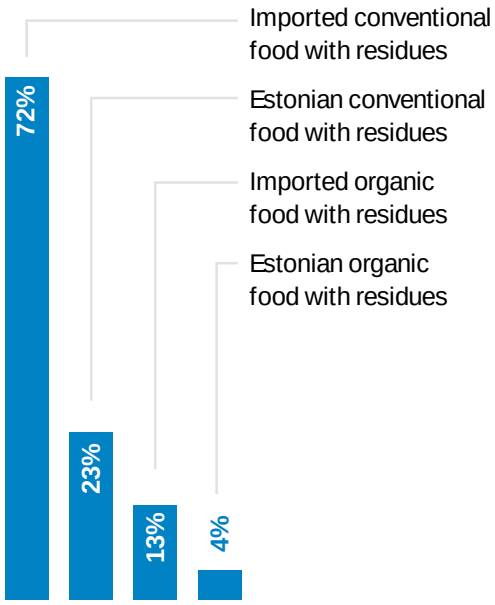
Did you know that

producers respond to the preferences of consumers. An example of this is restriction of the user of additives in processed meat products. The packaging of many producers is marked “No E621”.

106. Every year, the VFB publishes the generalised results of the laboratory tests of food on its website[47]. The report is meant for Estonian people and is the only source of information about pesticide residues in food, because this information is not given on food packaging.

107. The laboratory test reports of the VFB include generalised indicators by foodstuffs and focuses on the cases where MRLs were exceeded. However, the report does not explain that the lowest levels (4%) of pesticide residues were found in local organic production and the highest levels (72%) in conventionally produced imported products (see Figure 14).

Figure 14. Share of samples that contained measurable quantities of residues of active substances of pesticide residues in 2016 (%)

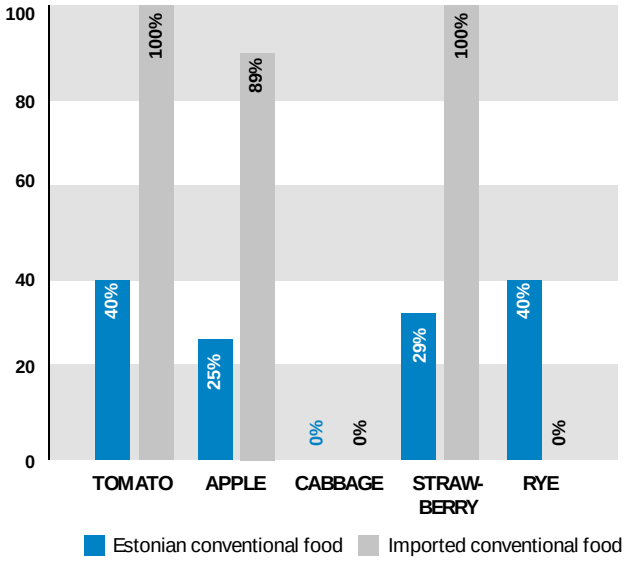


Source: National Audit Office on the basis of the data of Veterinary and Food Board

108. The foodstuffs in which the largest quantities of pesticide residues were found have not been highlighted and there is no comparison of Estonian and imported food. For example, residues were found in all samples of imported strawberries and tomatoes (see Figure 15).

[47] VFB website: https://vet.agri.ee/?op=body&id=819

Figure 15. Share of samples with measurable quantities of residues of active substances of pesticide residues in 2016 in comparison of Estonian and imported food (%)



Source: National Audit Office on the basis of the data of Veterinary and Food Board

VFB reduces the lab results it shows by 50%, which misleads consumers

Did you know that

at the laboratories where the VFB has food samples tested, the results are accurate and there is no reason to doubt them, as the laboratories are internationally recognised and their testing methods are accredited.

109. The National Audit Office analysed the lab test reports for 2013-2017[48] and compared the generalisation prepared for the general public with the data on which they were based. It became evident that the VFB subtracts 50% from the data received from the laboratory and compares the result with the established MRL. The general public have not been informed about such data processing so far. Consumers are only presented information about excesses levels if they are too high even after the application of the so-called expanded measurement uncertainty of 50% and people are not informed about this data processing principle.

110. This conduct is based on the sample taking guideline approved by the Director General of the VFB[49], which transposes the guidelines prepared by the European Food Safety Authority (see Annex D for the explanation of measurement uncertainty). In the option of the National Audit Office, this directive has been applied for informing consumers in error.

111. The actual purpose of the guideline of the European Food Safety Authority is to regulate the situation where implementation of sanctions in respect of food business operators may be necessary[50]. The expanded

[48] https://vet.agri.ee/?op=body&id=819

[49] Directive No 32 of the Director General of the VFB of 20 February 2018 "Guideline for taking samples within the scope of the pesticide residue control programme for determination of pesticide residues in food", http://www.eurl-pesticides.eu/library/docs/allcrl/AqcGuidance_SANTE_2015_11945.pdf (p 15, point E10).

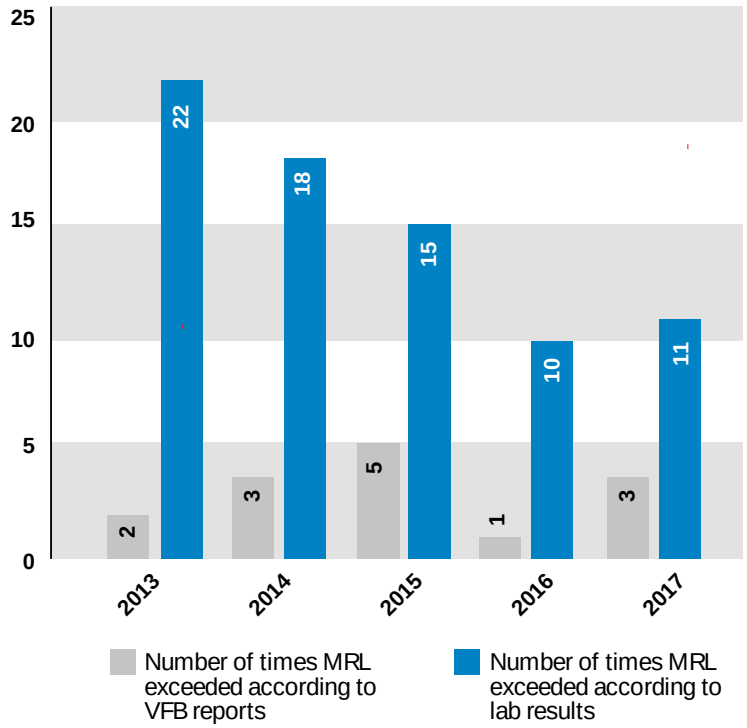
[50] The purpose of the guideline is to describe to laboratories how to present test results as accurately as possible and with a small measurement uncertainty. The guideline gives instructions for cases where MRLs have been exceeded and the person responsible should be punished for this. The capability of the laboratories of EU countries (incl. the accuracy of the data submitted by the labs) may be different and attempts are made to avoid the situation where food that complies with requirements on the basis of the lab tests performed in one country could be declared hazardous in another and result in the punishment of the operator.

measurement uncertainty accepted in the EU could be used in this case and the lab results must be adjusted in favour of the producer by subtracting 50% from the result. Thus, a food business operator can only be punished if the result of the laboratory test exceeds the MRL even after the result has been reduced.

112. The National Audit Office finds that this provision of the guideline only applies to the cases where sanctions must be imposed on a food business operator and not to the use of lab results for determining the country's own risks or to the information presented to consumers[51].

113. The National Audit Office analysed the data of the laboratory tests of the VFB (from 2013-2017), which revealed that the number of cases where maximum levels are exceeded is considerably higher without the application of expanded measurement uncertainty than the number of cases in which the consumers have been informed about this (see Figure 16).

Figure 16. Number of food samples where maximum residue levels (MRL) were exceeded without and with consideration of expanded measurement uncertainty from 2013-2017



Source: National Audit Office on the basis of the underlying data of the analyses of Veterinary and Food Board

[51] The respective methodology has always been explained if such data processing is used (e.g. by the EFSA or another country). For example, the actual lab results are always given in the reports prepared in the United Kingdom, and compliance with legal requirements is also indicated. The cases where hazards are potentially too big have also been separately assessed solely on the basis of lab tests. See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784337/pesticide-residues-quarter3-2018-report.pdf.

The VFB makes misleading statistical generalisations when processing data

114. In addition to making lab results look cleaner than they actually are, the food analysis reports also contain misleading information about the quantity of samples tested for residues of various pesticides and the share of samples with residues among all samples. The data presented in the report make the impression that the presence of all of the residues on which the analysis focused (455) was tested in all food samples. Actually, active substances are tested selectively, but the generalisation of whether or not anything was found is made about all the analysed foodstuffs (see examples in Table 1).

115. According to the VFB, it presumes that there are no residues in the samples that were not tested for the presence of the respective residues. In the opinion of the National Audit Office, this presumption is not justified and the VFB has not presented the information at its disposal to consumers correctly.

116. Table 1 shows the presence of pesticide residues in the food of Estonian people on the basis of the lab tests made in 2016 and the report of the VFB. The National Audit Office found the shares on the basis of the number of food samples and the pesticide residues for which the samples were tested (e.g. 18 food samples, not 349, were tested for glyphosate), and calculated the share according to the number of tested food samples in which residues were found.

Table 1. Share of presence of pesticide residues in food samples in 2016 according to the VFB report and the lab results. The VFB has calculated the shares in a manner as if all food samples (349 in total) were tested for all residues

Chemical	Number of samples tested for the chemical	Frequency (%)	
		According to laboratory	According to VFB
Chlormequat	51	29	4
Mepiquat	51	18	3
Dithiocarbamates	163	12	7
Glyphosate	18	11	1
Dithianon	28	4	1

Source: National Audit Office on the basis of the data and laboratory tests of Veterinary and Food Board

Did you know that

The Consumer Protection Authority has analysed the sources from which consumers seek information and found that television is the most efficient format for informing the general public. It is also the most expensive format. It is followed by radio and newspapers. The efficiency of informing via the blogs of authorities is relatively small, as people don't read them.

117. When responding to the report of the 2009 audit of the National Audit Office, the MRA promised to publish the most important results of the pesticide residue tests in at least one national newspaper every year in order to inform consumers. This has not been done.

118. The main channels for informing consumers in the VFB and the MRA are their websites and blogs (https://maablogi.wordpress.com/). The officials of the VFB have published a few articles about the hazards related to contaminants in media. A few posts about food safety have also been made on the Facebook page of the VFB. According to the MRA and the VFB, blogs and Facebook posts reach consumers better if printed media covers the posts as news. Posts may also be followed by interviews on radio and TV.

119. The MRA and the VFB also issue food handbooks and information materials aimed at food business operators. The website www.toiduteave.ee if also used to give information to operators.

Recommendations of National Audit Office

120. **Recommendations of the National Audit Office to the Director General of the Veterinary and Food Board:**

- Present the actual data of the quantities of pesticide residues in analysed food samples to the general public and separately the 50% measurement uncertainty and the methods used to process the samples. Explanations of excess MRLs should be given on the basis of the actual lab results.
- Present the data of lab tests on the basis of the analyses that were actually performed. Presumptions that substances are not present if their presence is not tested should no longer be made. Residues should be presented in reports by products and countries of origin.
- The open data concerning food analyses (places where samples were taken, test results, etc.) should be made accessible and easy to find on the website of the Veterinary and Food Board.

Response of the Director General of the Veterinary and Food Board: When we publish results, we present data and explain the results of the analyses to the general public in three categories: 1) the results were the identified pesticide residue was below the MRL; 2) the results where the identified pesticide residue is below the MRL considering the 50% measurement uncertainty; and 3) the results where the identified pesticide residue exceeds the MRL.

The EFSA is currently developing a data publication platform, where the detailed data of the samples taken by the Member States will be accessible to everyone and machine-processable (business secrets, personal data and other delicate information will not be included in the data): https://www.efsa.europa.eu/en/press/news/190117. Therefore, the VFB doesn't find it necessary to establish a separate system for the publication of detailed data.

Taking these recommendations into account requires improvement of the quality of data collection and the creation of interfaces with the laboratory of the Health Board, the laboratory of the Agricultural Research Centre and the information systems of the AB for sending and collection of the detailed data of the results of pesticide residue tests, which requires extra funding.

Declaring food unsafe and preventing it from reaching consumers

The VFB doesn't assess possible hazards in tested food

121. If food sold in shops may be hazardous (e.g. it contains too many pesticide residues or bacteria that may cause illness), it's necessary to ensure quickly that such food doesn't reach consumers. The hazardousness of food is identified on the basis of the harmful effect of residues on people's health[52].

[52] The exact criteria are given in Directive No 169 of the Director General of the VFB of 31 December 2013 on the implementation of a rapid alert system for food and feed, and in the

122. The VFB must inform people and food business operators about hazards and guarantee that such food does not get from the warehouse to the seller, the seller to the consumer, or that the seller take the hazardous food back from the consumers. If a hazard is identified in food imported to Estonia or in food produced in Estonia and exported from here, the VFB must inform the other European Union Member States about the hazard as well (i.e. submit a notification in the EU rapid alert system for food and feed). (See Annex G.)

123. The National Audit Office assessed the laboratory tests where the MRLs of pesticides were exceeded and how the VFB has identified the hazardousness of the residues found in food, informed people (incl. other EU countries) about the hazards and guaranteed that products are withdrawn from the market and recalled from consumers.

124. The analysis carried out by the National Audit Office revealed that the VFB itself does not assess the hazardousness of the residues found in food. The VFB only declares food non-compliant if the MRL is exceeded even after 50% is subtracted from the lab result that exceeds the MRL.

125. Nothing must be subtracted from the lab result when the hazard related to excess MRL is assessed, as it distorts the calculation of how many pesticide residues will be ingested by people from food. The MRL is just one aspect in the assessment of hazardousness. Possible health effects, various consumer groups (e.g. babies, small children, pregnant women) and people's eating habits must also be taken into account.

126. The VFB does not assess the following risk factors required in the EU guidelines and also the directive of the Director General of the VFB, i.e. whether

- food contains the residue of a pesticide banned in the EU;
- food contains the residue of a pesticide (incl. pesticides that damage the development of foetuses, damage the DNA or cause cancer) in the case of which it's likely that Estonian people eat such food in quantities whereby the safety threshold is exceeded (i.e. the residue exceeds the acute reference dose or, if it hasn't been established, the acceptable daily intake).

127. In the case of the examples given in Tables 2-4 below, the VFB should have assessed the above risk factors in any case. The VFB actually issued precepts for withdrawal of the food from the market and recalling it from consumers in very few cases, and only submitted notifications to the EU rapid alert system if the MRL was exceeded (i.e. if the MRL was exceeded even after 50% had been subtracted from the lab results).

128. However, the National Audit Office identified exceptions here as well, and the VFB is unable to justify them. In two cases, the lab result was given in the notification and in two cases, the measurement uncertainty given by the laboratory had been subtracted from the result (see Annex D). The tables indicate the origin and type of food that has

"Guidelines for the calculation of consumer intake and evaluation of the risk for pesticide residues" of the European Commission of 2016.

been the most contaminated on the basis of lab analyses and whether alert notifications were sent to the EU rapid alert system.

Table 2. Cases where MRLs of active substances of pesticides were exceeded (without consideration of measurement uncertainty) and notifications submitted by the VFB to the EU rapid alert system in 2015

Origin of food	Food-stuff	Active substance found	Quantity (mg/kg)	Maximum level of active substance (mg/kg)	Alert notify-cation submitted *
Estonia	Baby food	Boscalid	0.016	0.01	–
		Chlormequat	0.025	0.01	
Spain	Broccoli	Dithiocarbamates	1.504	1	–
Spain	Broccoli	Dithiocarbamates	1.069	1	–
Netherlands	Broccoli	Dithiocarbamates	1.038	1	–
Netherlands	Broccoli	Dithiocarbamates	1.369	1	–
Netherlands	Broccoli	Dithiocarbamates	2.192	1	Yes
Netherlands	Broccoli	Dithiocarbamates	1.112	1	–
Netherlands	Broccoli	Dithiocarbamates	2.116	1	Yes
Italy	Broccoli	Dithiocarbamates	3.92	1	No
Italy	Grapes	Formetanate	8.074	0.1	Yes
Poland	Broccoli	Chlorpyrifos	0.113	0.05	Yes
Poland	Peas	Picoxystrobin	0.011	0.01	–
Poland	Raspberries	Fenazaquin	0.011	0.01	–

* The dash marks the cases where the foodstuff was not exported from Estonia or where MRLs were exceeded by less 50% and whereby the VFB did not check whether a notification should've been submitted on the basis of the safety threshold calculations.

Source: National Audit Office on the basis of the data of Veterinary and Food Board

Did you know that

according to the VFB, the Estonian baby food specified in Table 2 was not exported from Estonia and sending an alert notification to the EU rapid alert system would not have been justified. The VFB issued a product recall precept to the producer about the contaminated baby food.

One-third of food was actually kept from reaching consumers: **11,317** jars of baby food of the 18,996 jars that were placed on the market **were consumed by Estonian babies.**

129. The findings concerning excesses of pesticide residues in food in 2016 are given in Table 3. No European alert notification was given about the Brazilian apples, where the residue exceeded the MRL according to the VFB report on laboratory tests of food in 2016[53] (i.e. exceeded even after 50% was subtracted).

Did you know that

The 2016 reports of the VFB include the misleading claim that hazardous Brazilian apples were recalled from the market. All the apples were actually sold before the precept was issued. The VFB didn't inform the consumers about this and the consumers never knew that they were exposed to the risk.

[53] Samples of traded, imported and local fruits, vegetables and cereal, food for babies and small children and other food taken during supervision for control of pesticide residues in 2016, p 10. https://vet.agri.ee/static/files/1918.VTA%20ja%20PMA%20TKVJ%202016.a%20aruanne.pdf

Table 3. Excess levels of active substances of pesticides (without consideration of measurement uncertainty) and notifications submitted by the VFB to the EU rapid alert system in 2016

Origin of food	Food-stuff	Active substance found	Quan-tity (mg/kg)	Maximum level of active substance (mg/kg)	Alert noti-fication submitted *
Brazil	Apple	Chlorpyrifos	0.034	0.01	No
Spain	Broccoli	Dithiocarbamates	1.06	1	–
Spain	Broccoli	Dithiocarbamates	1.081	1	–
Spain	Tomatoes	Mepiquat	0.026	0.02	–
Spain	Tomatoes	Mepiquat	0.024	0.02	–
Republic of South Africa	Wine	Mepiquat	0.038	0.02	–
Moldova	Wine	Chlormequat	0.087	0.05	–
Chile	Wine	Chlormequat	0.1	0.05	–
Chile	Wine	Chlormequat	0.058	0.05	–
United States	Wine	Mepiquat	0.03	0.02	–

* The dash marks the cases where the foodstuff was not exported from Estonia or where MRLs were exceeded by less 50% and whereby the VFB did not check whether a notification should've been submitted on the basis of the safety threshold calculations.

Source: National Audit Office on the basis of the data of Veterinary and Food Board

130. The foodstuffs that exceeded the MRLs of active substances of pesticides in tests in 2017, about which only one notification was sent to the EU rapid alert system, are listed in Table 4. The need to send an urgent notification, proceeding from the degrees of hazard, was not considered in the other cases where MRLs were exceeded.

Table 4. Excess levels of active substances of pesticides (without consideration of measurement uncertainty) and notifications submitted by the VFB to the EU rapid alert system in 2017

Origin of food	Food-stuff	Active substance found	Quantity (mg/kg)	Maximum level of active substance (mg/kg)	Alert notifi-cation submitted *
Estonia	Tomatoes	Tau-fluvalinate	0.252	0.1	–
Estonia	Rapeseed	Thiamethoxam	0.022	0.02	–
Egypt	Oranges	Dimethoate	0.039	0.02	–
Egypt	Oranges	Dimethoate	0.033	0.02	–
China	Pomelo	Flusilazole**	0.026	0.01	No
Italy	Kiwi	Dithiocarbamates***	0.38	0.05	Yes
Cambodia	Rice	Carbendazim**	0.013	0.01	–

Did you know that

in respect of the Estonian tomatoes mentioned in Table 4, the VFB noted that the entire batch was consumed before it was recalled. The VFB report states in error that the tomatoes were recalled from the market, which may have convinced the consumers that the hazard didn't reach them.

The VFB reports contained similar misleading information about Italian kiwis as well. See also Table 5 for the quantity of hazardous food that reached the consumers.

		Hexaconazole**	0.02	0.01	
Lithuania	Carrot	Propamocarb	0.017	0.01	–

* The dash marks the cases where the foodstuff was not exported from Estonia or where MRLs were exceeded by less 50% and whereby the VFB did not check whether a notification should've been submitted on the basis of the safety threshold calculations.

** Use of the substance when growing food is prohibited in the European Union.

*** The group of dithiocarbamates includes six chemicals, three of which are banned.

Source: National Audit Office on the basis of the data of Veterinary and Food Board

Did you know that

The VFB does not analyse active substances in the case of which no separate MRL has been determined for the combination of the active substance and the foodstuff, and does not take into account that so-called default MRLs are applied in the European Union in such cases, which could be used as the basis.

For example, the National Audit Office had Norwegian salmon analysed during the audit, and excess MRLs of two banned substances (DDT and ethoxyquin) were found in the samples. Salmon has not been analysed for these substances before.

131. The VFB and MRA justified the situation by claiming that the Board is not a risk assessment authority and cannot be required to calculate safety thresholds or assess the toxicological properties of chemicals. In the opinion of the National Audit Office, functions related to food safety cannot be performed without assessing risks (incl. identifying the cases where the safety threshold is exceeded) and the Board must acquire the relevant know-how.

132. The National Audit Office points out that the VFB has assessed the hazards related to food more thoroughly in previous years and has also used the Pesticide Residue Intake Model (PRIMo[54]) employed by the European Commission. The VFB could not explain to the National Audit Office why it's not doing this anymore.

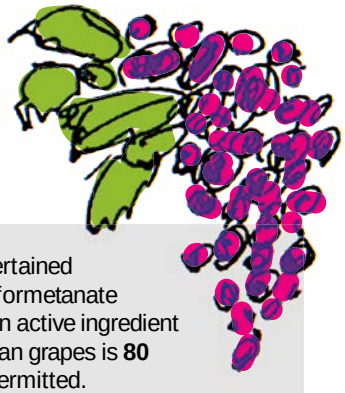
133. The aforementioned directive of the Director General of the VFB lists the important criteria that could be used to reduce the hazards related to residues. The VFB does not comply with its own or the European Commission's guidelines.

Perishable hazardous fruits and vegetables are often consumed before they are recalled.

134. The National Audit Office analysed whether food declared hazardous reaches consumers. In addition to the cases given in Tables 2-4, the cases where information about hazardous foodstuffs sold in Estonia reached us from other countries were also analysed. Table 5 includes all of the cases analysed by the National Audit Office and information on the quantities of the hazardous products that reached people. Hazardous fruits and vegetables could not be prevented from reaching consumers. Figure 17 contains an example from 2015, when the residue content in grapes exceeded the MRL 80 times, but they could not be prevented from reaching consumers.

[54] The PRIMo (Pesticide Residue Intake Model) model created by the EFSA collects the dietary information of the residents of Member States and can be used as the basis for calculating the risks related to the dietary habits of the so-called average European. See https://www.efsa.europa.eu/en/applications/pesticides/tools. Several countries have created risk assessment models for themselves on the basis of their dietary studies. See http://www.hse.gov.uk/pesticides/topics/pesticide-approvals/pesticides-registration/data-requirements-handbook/consumer-exposure.htm for the example of the United Kingdom.

Figure 17. Example from 2015, when hazardous grapes from Italy all reached consumers



- In 2015, it was ascertained that the content of formetanate residues, which is an active ingredient in pesticides, in Italian grapes is **80** times higher than permitted.
- A safe quantity of these grapes for a child weighing 20 kg would have been **20** grams.
- All **3.8** tons of these grapes reached consumers.

Source: National Audit Office on the basis of the data of Veterinary and Food Board

135. The VFB explained this with the fact that laboratories send the test results of the samples taken from fruits and vegetables in a month, which means they have no grounds for responding faster. When samples are taken, it's presumed that the products don't exceed the MRLs established for pesticide residues and the batch is not stopped. The test results of samples taken from food of animal origin arrive faster and it's therefore more likely that a hazardous product can be prevented from reaching consumers.

Table 5. Cases analysed by the National Audit Office where hazardous foodstuffs could not be prevented from reaching consumers

Year	Origin	Foodstuff	Identified substance	Hazardous quantity that reached consumers
2018	Argentina	Apples	Thiophanate-methyl	Total quantity placed on market: 72 kg
2018	Turkey	Grapefruit	Fenthion*	Total quantity placed on market: 1.82 tons
2018	Turkey	Grapefruit	Fenthion* Imazalil	Total quantity placed on market: 557 kg
2017	Italy	Kiwi	Dithiocarbamates**	Total quantity placed on market: 10 tons
2017	Estonia	Tomatoes	Tau-fluvalinate	Unknown
2016	Brazil	Apple	Chlorpyrifos	Total quantity placed on market: 1.21 tons
2015	Italy	Grapes	Formetanate	Total quantity placed on market: 3.89 tons
2015	Spain	Broccoli	Dithiocarbamates**	Total quantity placed on market: 7.5 tons
2015	Estonia	Baby food	Boscalid Chlormequat	*Ca* 1/3 of the quantity placed on the market,

				i.e. 11,317 jars (2.1 tons)
2015	Italy	Broccoli	Dithiocarbamates**	Total quantity placed on market: 5 kg
2015	Poland	Broccoli	Chlorpyrifos	1.25 tons

* Use in food farming is prohibited.

** The group of dithiocarbamates includes six chemicals, three of which are banned.

Source: National Audit Office on the basis of the data of Veterinary and Food Board

136. The VFB also explained that if another country has sent a notification about hazardous food to the EU rapid alert system and the food has also reached Estonia, responding to the alert notifications, incl. identifying the resellers of the hazardous food, may take time.

137. The National Audit Office notes that losing time upon the identification of hazardous products is to some extent unavoidable. The problem arises from the long procedural chain and the complicated structure of the EU rapid alert system. When making consumption decisions, consumers must take into account the possibility that hazardous products (especially fruits) may still be on the market. This should motivate the VFB and MRA to contribute even more to informing people about possible hazards (e.g. which products have been the most contaminated over the years)[55].

Conclusions and recommendations made by the National Audit Office

138. In the opinion of the National Audit Office, the information of the MRA and VFB that is given to consumers is not complete or transparent. The best practices of EU Member States (e.g. the reports on food analyses of the United Kingdom and Denmark) are not followed when the general population is informed about food hazards. When submitting alert notifications to the EU rapid alert system, the VFB fails to follow its own established procedure and hazardous food may still reach consumers.

139. **Recommendations of the National Audit Office to the Director General of the Veterinary and Food Board:**

- In all cases where the hazardousness of tested food is assessed and notifications are submitted to the EU rapid alert system, proceed from the hazard assessment criteria given in the directive of the Director General of the VFB and the guidelines of the European Commission.
- Start using a risk assessment model (e.g. PRIMo) employed by the EFSA again and, if necessary, establish a national assessment model on the basis of the Estonian dietary study, which can be used to assess the quantities in which pesticide residues are consumed and the hazardousness of products.

Response of the Director General of the Veterinary and Food Board: The VFB agrees that the practice of assessing food safety must be changed. The PRIMo model of the EFSA will be used for assessment of the hazardousness of food in terms of pesticide residues.

[55] There are many consumer websites in the world, which publish information related to harmful residues in food. For example, people are also informed about contaminated food, see https://www.ewg.org/foodscores.

Notifications will be sent to the RASFF according to the RASFF's "Guidelines for the calculation of consumer intake and evaluation of the risk for pesticide residues". The issue of implementing the measurement uncertainty and the use of the EFSA's PRIMo model are both explained in said guideline.

/digitally signed/

Ines Metsalu-Nurminen
Director of Audit, Audit Department

Recommendations made by National Audit Office and responses of the auditees

The National Audit Office made several recommendations to the Ministry of Rural Affairs, Veterinary and Food Board and the Consumer Protection and Technical Regulatory Authority on the basis of the audit. The Minister of Rural Affairs and the directors general of the boards sent their responses to the recommendations made by the National Audit Office from 22 to 23 April 2019.

The table below gives a summary of the recommendations made and the responses received. The area about which the recommendation was made, the number of the paragraph of the text of the recommendation in the report, the text of the recommendation and the numbers of the paragraphs that cover the topic about which the recommendation was made are indicated in the left column of the table. The comments made by the auditees about the recommendations made by the National Audit Office are in the right column.

General comments on audit report
Response of the Minister of Rural Affairs: Thank you for the preparation of the draft of the audit report "Activities of the state in guaranteeing food safety". Guaranteeing food safety is important in the world as well as Estonia, both for the protection of public health and in relation to trade policy. The Estonian food safety system is a part of the European Union one, which is considered the system that guarantees the highest level of food safety to consumers in the world. All food contains chemical substances and in recent years, more attention has been given to the risks arising from them. Both natural and added substances in food are chemical hazards, which can potentially have a harmful effect on health and be present in all food (incl. organically produced food). The draft of the new "Development plan of agriculture and fishery 2030" also highlights the need to give more attention to long-term effects, i.e. chemical risks, and making supervision of these risks more efficient, incl. by increasing monitoring, is also planned in the development plan. In January 2019, the European Court of Auditors published its audit "Chemical risks in our food", the results of which could've also been recognised in the report of the National Audit Office. The conclusion made in the report of the National Audit Office is that the Ministry of Rural Affairs and the Veterinary and Food Board claim that all of the food sold in Estonia is safe, although this is not the case for various reasons in the opinion of the National Audit Office. The Ministry of Rural Affairs has not claimed that all of the food sold in Estonia is safe. The Ministry of Rural Affairs bases its opinions on the multiannual national control plans prepared by the Veterinary and Food Board, which indicate that the number of non-compliant samples in recent years has comprised *ca* 3-4% of all samples, and 2% in terms of pesticide residues. The National Audit Office pointed out that the Ministry of Rural Affairs has not commissioned scientific research of the risks arising from pesticide residues. The Ministry of Rural Affairs explains that the requirements established for food safety arise largely from European Union legislation. The Ministry has therefore proceeded from the principle that the EFSA has assessed the aforementioned risks on a scientific bases before the establishment of European Union legislation and they are taken into account when the active substances of pesticides are approved. We point out that the EFSA uses the dietary and supervision data received from Member States, incl. Estonia, when making its risk assessments. However, the Ministry of Rural Affairs is ready to launch broad-based and more expensive studies related to residues of the active substances of pesticides, which requires finding additional funds from the state budget. The expected increase in the funding of research and development in 2020 will make it possible. One of the problems highlighted in the report is the incapacity of laboratories, incl. national laboratories, to earn income for updating their equipment. The laboratory council of ministries has discussed the revenue earned by laboratories and prepared a proposal to not support the investments of laboratories that are aimed at the provision of services to the private sector. The issue of earning own revenue has been strongly raised by the private sector organisations operating on the Estonian market, which find that the provision of lab services for a fee by national agencies on the free market with equipment purchased for the state's money creates unfair competition for private laboratories and is therefore state aid. There is no solution that would satisfy all parties in the present organisation of lab services. The council of laboratories continues discussing this issue in cooperation with the Ministry of Finance in order to find an optimal solution. **Response of the Deputy Director General of the Agricultural Board:** In response to the observation made in the draft audit report about the activities of the Agricultural Board (AB) (p 2), we would like to say that the AB does not supervise the use of fertilisers and consequently cannot collect the specified data. Neither does the EFSA (p 6) assess fertilisers or their ingredients. Data about the pesticides used exist, because the pesticides that may be used, the crops on which they may be used and the maximum doses in which they can be used are determined in the conditions of authorisation of pesticides, which is a function of the AB. Development toxicity and the relevant tests (p 7) have always been under the spotlight upon the authorisation of pesticides (this is an obligation that arises from the EU data requirements regulation 283/2013). Temporary MRLs are established for unauthorised (deleted from the list) active substances of pesticides (p 8), as the presence of their residues cannot be immediately ruled out. These MRLs are generally close to the limit of analytical determination (0.05 or 0.01). For example, the MRL of active substance iprodione for strawberries after the reassessment by the European Food Safety Authority (EFSA) is 0.05 mg/kg. More explanations, incl. about EU rules and the conditions of authorisation of pesticides were given during the audit. Supervision in the area of plant protection is planned according to risks. One of them is the size of the cropped area, as the quantity of the produce that goes into circulation depends on this (in case requirements are ignored). Producers of plant products are obliged to indicate the name of the pesticide, the time of use, the maximum dose, the area of land and the crop on which the pesticide was used must be indicated in the field book. Thus, in addition to the conditions of authorisation and the information

collected during supervision, the AB has an overview of the pesticides used (p 16), which in its turn is one of the bases for planning supervision where more controls (and sample-taking) are aimed at crops on which various pesticides are more frequently used or where their use may entail more risks to the environment (incl. bees and other useful insects), and more attention is also given to crops that are consumed by consumers when fresh (e.g. strawberries, new potatoes). The interval of supervision and the number of controls and samples taken determined by the existing resources. The AB controls *ca* 450 companies/production sites per year. The number of controls can be increased, but each 100 additional controls require one additional position that costs an estimated 42,000 to 45,000 euros plus the cost of lab tests, which is *ca* 28,000 euros.

Division of functions and responsibilities (p 9). The AB's area of responsibility in relation to pesticides can be divided in two larger areas of work, where one of the functions is to authorise new pesticides and determine the conditions of their use, also the regular (re)assessment of authorised pesticides, as each pesticide is authorised for a certain period of time and is then subject to reassessment in light of the new information collected within the scope of scientific research. At EU level, assessment is carried out in zonal cooperation with the responsible authorities of neighbouring countries with similar climatic and other conditions, and Estonia belongs to the northern zone with Finland, Sweden, Norway, Denmark, Latvia and Lithuania. The other function of the AB in the area of pesticides is to guarantee (primarily as a measure of environmental protection) supervision of the import, marketing, storage and use of pesticides in Estonia as well as the technical order of plant protection equipment (sprayers). A related function is participation in the approval of curricula and plant protection training and issue of the certificates of plant protection workers required by law. A separate area of control is the use of extremely toxic pesticides, where fumigation of the goods is an obligatory condition upon their export to third countries. The purpose of taking samples of growing plants and testing them during supervision is also to ascertain that the requirements for use of pesticides are complied with (i.e. has an authorised pesticide been used, has a pesticide authorised for use on the specific crop been used, has the permitted maximum dose been followed, have the other restrictions established for safety been complied with, etc.). The performance of functions in each area of work requires officials to have the relevant professional qualifications.

Efficiency of supervision. The AB processes *ca* 30 violations in the area of plant protection per year. For example, three of the six complaints received by the AB in 2018 about the death of bees were related to the incorrect use of pesticides. Unfortunately, compensation of the environmental, economic and other damage in the case of such breaches as well as the restoration of a lawful situation cannot be achieved with precepts or other measures, so the AB can simply log the breach. Origin fraud related to fresh fruits and vegetables has been under the attention of the AB and the general public for years. The objective of fraud is to earn more revenue by selling produce from other countries (apples, strawberries, fresh peas, carrots, potatoes, etc.) for a higher price as local produce, as the consumers prefer to buy local produce and trust it more. The sellers on markets and in other public points of sales, thousands of which are seasonally established and where fraud is the most frequent, don't usually have documents that prove the origin of the products, or there is reason to suspect that they are not genuine. This activity can be suspended with precepts, but usually until the official leaves – this is something that other traders have also informed the AB about. Thus, the only measure at the disposal of the AB today is publication of those who are in breach.

The lack of sanctions that can be applied to the persons who ignore the rules prevents more efficient supervision in the areas of both pesticides and gardening products; the entrepreneurs are well aware of this and have pointed it out themselves in the course of misdemeanour proceedings. Thus, we cannot speak of the preventive impact of punishments in these areas. However, Article 139 of Regulation (EU) 2017/625, which will enter into force on 14 December this year, requires Member States to establish punishments and the grounds on which they are imposed as well as inform the European Commission about them.

Director General of the Consumer Protection and Technical Regulatory Authority: Point 89 of the draft states as follows: "The audit revealed that the VFB and the AB have the right to inspect the origin fraud related to fresh fruits and vegetables (e.g. strawberries, apples, carrots), but only the VFB or the Consumer Protection and Technical Regulatory Authority can punish the persons who resort to such fraud. The maximum fine the VFB can impose on a legal entity is 2,600 euros, but the fine that can be imposed by the Consumer Protection and Technical Regulatory Authority is 32,000. The latter doesn't actually control fraud related to the origin of fruits and vegetables, although the Food Act gives it the right to do this".

We explain that pursuant to subsection 47 (1) of the Food Act, the Veterinary and Food Board exercises state and administrative supervision in all areas of handling. Pursuant to both the Food Act and Regulation (EU) No 1169/2011 of the European Parliament and of the Council, which regulate the presentation of food information to consumer in the case of a breach, the supervision competence of the CPTRA arises from subsection 47 (2) of the Food Act. Pursuant to this provision, the CPTRA carries our state supervision of compliance with the requirements for submission of information and the correctness of the submitted information in retail companies in addition to the Veterinary and Food Board (VFB).

The Plant Health and Horticulture Department of the Agricultural Board (AB) organises state supervision of compliance of fresh fruits and vegetables with marketing standards in all stages of marketing: at the levels of the producer, retailer and wholesaler, and upon import and export. The marketing of fresh fruits and vegetables are supervised pursuant to the European Union Common Agricultural Policy Implementation Act EUCAPIA. § 61 of the EUCAPIA stipulates the marketing standards for fruit and vegetables and conformity checks. Pursuant to subsection 61 (1) of the EUCAPIA, the quality of fruit and vegetables specified in relevant regulations of the European Union must be in conformity with the marketing standards set forth in the same regulations. The following must be noted on the products marketed on the basis of the specific marketing standard: name of the product; country of origin; quality class; name of variety (apples, pears, oranges, grapes). The country of origin must be noted on the fresh fruits and vegetables marketed on the basis of the general marketing standard.

Pursuant to subsection 61 (2) of the EUCAPIA, the AB is the competent authority in the field of checking the conformity of fruit and vegetables with the marketing standards.

The requirement that the information concerning food must be correct and that misleading consumers is prohibited is stipulated by § 38 of the Food Act and Article 7 of Regulation 1169/2011. As Regulation 1169/2011 is a EU regulation and therefore directly applicable, and superior to national laws as EU law, Article 7 of the Regulation must be treated as a special provision in respect of subsection 38 (2) of the Food Act. The marketing standards of fresh fruits and vegetables and compliance checks are stipulated in the EUCAPIA and the regulation "Detailed procedure for supervision of compliance with marketing standards of fruits and vegetables and special procedure for supervision of compliance with marketing standards in the retail stage" established on the basis of the EUCAPIA. Both of them stipulate a similar general principle that food information may not mislead the consumer, but the regulation in specific marketing standards is more detailed and establishes mandatory requirements for the marking of fresh fruits and vegetables in respect of which the consumers may not be misled. The country of origin and name of variety of fresh fruits and vegetables is one of such important requirements.

The regulation of unfair commercial practices in the Consumer Protection Act (CPA) is based on the EU Unfair Commercial Practices Directive. Thus, the EU Unfair Commercial Practices Directive has the status of a general rule and its provisions are only applies insofar as there are no specific provisions and legal norms in the respective area.

The opinion of the CPTRA is that implementing the regulation of unfair commercial practices upon the identification of the origin fraud detected in the marketing of fresh fruits and vegetables would not be practical, as there are specific provisions and legislation that regulate the area.

Recommendations of National Audit Office	Responses of auditees
Risks related to food **44. Recommendation of the National Audit Office to the Minister of Rural Affairs:** ▪ In order to ensure an increase in healthy life expectancy and the opportunity to have a say in the development of EU rules, implement the scientific potential of Estonia and develop a system for analysing contaminants, incl. pesticides, that would be based on the actual eating habits of the Estonian people and assess the risks arising from contaminants in food. Also to ensure that the acceptable daily intake (ADI) and acute reference doses (ARfD) are taken into account when pesticide residues and additives are assessed.	**Response of the Minister of Rural Affairs:** The Ministry of Rural Affairs agrees with the conclusions of the National Audit Office that the volume of risk assessments should be bigger. The Ministry of Rural Affairs has commissioned exposure assessments in respect of some topics (e.g. nitrites in food, exposure to caffeine) or the officials of the Ministry of Rural Affairs have carried out exposure assessments. The Ministry of Rural Affairs has also entered into a permanent contract with the Estonian University of Life Sciences for the provision of scientific expert opinions and risk assessments and for readiness to provide the above. There are plans to continue with the cooperation and the development of a risk assessment system. The prepared risk assessments and expert opinions are necessary for assessing the food safety situation in Estonia, solving specific problems in the area of food safety and developing the opinions of Estonia in the discussions taking place in the European Union. We've submitted a request for additional funds for research and development from the budget for 2020. If the request is approved, the Ministry of Rural Affairs is prepared to start creating additional competency for risk assessments and then increase the volume of risk assessments in Estonia. On average, 15 amendments are made to regulations 1333/2008 and 1334/2008 in the area of flavourings in a year, which change the conditions of their use or expand their use, add or remove substances from the list of substances permitted in the EU. As for pesticide residues, 16 amendments to regulation 396/2005, which concern 93 active substances, have been adopted in recent years. An exposure assessment that considers the consumption habits of Estonian people in all population groups would take at least 100 hours per active substance and the estimated minimal cost of assessing these two areas would be 570,000 euros per year. Also, it may be necessary to assess exposure to existing substances again every year because of changes in eating habits and the practice of using such substances. This means that *ca* 10% of the compounds in the list of permitted substances must be reassessed per year, which means that the budget should be increased by another 600,000 euros. The need to expand surveillance, which again creates the need for extra funds, must also be taken into account in respect of this 10% of substances, i.e. surveillance required 18,000 euros when nitrites were studied.
▪ Prepare studies in cooperation with the Ministry of Social Affairs to identify the quantity of pesticide residues (incl. endocrine disrupting chemicals) ingested via food and their possible effect on health. Start a biomonitoring to identify the quantity of active substances of pesticides present in people's blood or urine. The data of these studies could also be used for planning actions in the area of public health. **points 21-43**	**Response of the Minister of Rural Affairs:** The Ministry of Rural Affairs shares the opinion of the National Audit Office that biomonitoring would make it possible to assess the exposure of people to various pesticide residues and their health effects. However, it must be kept in mind that this would be extensive research that requires considerable financial resources. A good example is the biomonitoring of micronutrients, which has been pending for years and is intended to cover the research of just five elements, but will cost *ca* 362,000 euros. The lack of scientific data for interpretation of the results is another restrictive factor. The Ministry of Rural Affairs will consult with Estonian scientists about the feasibility and scope of such research during the first half of 2020. If the research is feasible, we will submit an additional request for funds from the state budget. We will also consider the need for a preliminary analysis depending on the results of the consultations with scientists.
Food testing in laboratories **70. Recommendation of the National Audit Office to the Minister of Rural Affairs:** agree on in areas and laboratories in which tests are conducted in order to reduce duplication of the	**Response of the Minister of Rural Affairs:** The analysis of "Commissioning of an analysis of optimisation of the activities of national laboratories for the Ministry of Finance" was carried out on the order to the Ministry of Finance (2017/2018). A council was formed in 2018 of the representatives of the Ministry of Education and Research, Ministry of Justice, Ministry of the

Recommendations of National Audit Office	Responses of auditees
activities of laboratories (e.g. in the determination of pesticide residues). **points 63-69**	Environment, Ministry of Rural Affairs, Ministry of Economic Affairs and Communications and Ministry of Social Affairs in consideration of the analysis in order to guarantee that the activities of national laboratories are optimised and any issues related to the laboratories are resolved. Finding consolidation options in three areas (microbiology of food, quality of water and geology) started in 2018 and the analysis of increasing the efficiency of laboratory services will continue.
71. Recommendations of the National Audit Office to the Director General of the Veterinary and Food Board: ▪ In addition to the food tests prescribed in the EU, extend the selection of the foodstuffs tested in laboratories considering the kind of food that people consume the most as well as food in which pesticide or other contaminant resides are more likely to be found. ▪ Tests of organic food should be added to reports according to the recommendation of the European Commission that the number of these tests in the total should not exceed the share of organic food on the food market. ▪ More tests of additives in food should be ordered and the capacity of a laboratory to determine all of the most significant additives should be developed. ▪ All active substances should be tested at statistically correct weights in order to obtain information about the actual frequency of pesticide residues in the food sold in Estonia. If surveillance is not carried out in the correct proportions, it should be based on which pesticides are used the most and on which crops. **points 45-62**	**Response of the Director General of the Veterinary and Food Board:** In 2019 the Veterinary and Food Board expanded the monitoring of pesticide residues and other contaminants to the extent of the additional budget and is planning to extend the monitoring even further if continued financing is received, taking into account the monitoring recommendations of the European Commission and the supervisory priorities of the VFB. The goal after the analysis of the complete service of food safety is to map and list the sources of information that must be taken into account when supervision is planned (incl. when monitoring is planned) and to determine the criteria of how such information is to be used when supervisory priorities are set. Samples of organic food are taken by two agencies (the VFB and the AB) in the volume stipulated by law, but in order to ensure that the shares of organic and conventional food samples are statistically proportionate, it would be necessary to increase the number of conventional food samples by at least 300, which would require an additional 120,000 euros per year. The VFB is planning to change the planning of additive samples by updating the risk criteria that are the basis for monitoring plans. In the case of additional funding, the VFB would be able to order tests of more samples from laboratories and have more additives tested. The VFB finds it necessary to have access to the information that indicates the crops on which and the quantities in which pesticides are used in Estonia by primary producers in order to be able to plan risk-based supervision. In addition to the local information about the pesticides used in Estonia and the crops on which they are used, it is also necessary to have international information, as the VFB also controls food that does not originate from Estonia in addition to food that does originate from Estonia. Obtaining such information requires the establishment of an international register that would contain the data of all Member States. No such database exists at present.
Supervision of food producers and sellers **102. Recommendations of the National Audit Office to the Minister of Rural Affairs:** ▪ Assess risks in the multiannual national control plan and stipulate measures (incl. taking laboratory samples from the Estonian goods for sale), which would guarantee the systematic detection and reduction of origin fraud in order to protect the interests and competitiveness of local producers, and that products of correct origin reach the consumers.	**Response of the Minister of Rural Affairs:** The process of development of the multiannual national control plan, which also includes the supervision related to the systematic detection and reduction of origin fraud, was analysed in cooperation with the relevant agencies in the second half of 2018 within the scope of the analysis of the comprehensive food safety service. The Ministry of Rural Affairs led the process. As a result of this, it was decided to start developing a new concept of a control plan in April 2019 instead of the multiannual national control plan that had been used until then and to start implementing it in 2022. The principles of supervision of origin fraud will also be reviewed during this process. However, as regards the recommendation to protect the interests and competitiveness of local producers, we have to note that measures for this purpose cannot be stipulated due to the European Union rules for operation of the internal market and competition. The producers of all Member States operating on the internal market of the European Union must be guaranteed equal opportunities for marketing their products. Consumer protection can be the purpose of the measures related to origin requirements. Consumers must be guaranteed correct information about the origin of food, which they can take into account when making choices.
▪ Create a digital field book to collect information about the actual use of pesticides and fertilisers. This would help plan supervision that is more risk-based and analyse possible breaches without visiting the producers on site. It would also give generalised information about trends in the use of substances. **points 88-100**	**Response of the Minister of Rural Affairs:** Although field books can currently be kept on paper and electronically, larger agricultural producers mainly use electronic field books. For example, it's easier for farmers to observe the history of a field and the supervisory authority to control compliance with requirements and restrictions on the basis of the data entered in an electronic field book. However, field books are kept on paper as well and there are various reasons for this. These reasons must be taken into account when a digital field book is created and solutions must be found for them if possible. In respect of the transfer to a digital field book, it would also be necessary to assess whether

Recommendations of National Audit Office	Responses of auditees
	the costs this would bring about for the farmer and the state are proportionate to the benefits of this or whether information about the actual use of pesticides and fertilisers could be obtained in another manner as well. We add that a long-term knowledge transfer programme has been launched in the area of agricultural big data. One of the objectives of the programme is to promote the use of online IT solutions with the functions of a field book in agricultural companies. The first stage of the programme is currently ongoing and depending on the results of the feasibility study to be carried out, the further objectives of the programme may also include the creation of capability for connecting the state's information systems with said field book solution for data collection purposes.
103. Recommendation to the Minister of Rural Affairs and the Director General of the Consumer Protection and Technical Regulatory Authority: In cooperation of the AB, the VFB and the Consumer Protection and Technical Regulatory Authority, find a solution for better detection and processing of fruit and vegetable origin fraud and variety fraud, incl. decide which authority is primarily responsible for the detection and processing of such fraud. Implement effective sanctions for the prevention of further fraud. **points 89-94**	**Response of the Minister of Rural Affairs:** The principles of supervision of origin and variety fraud are currently based on the provisions of the cooperation agreement between the Agricultural Board and the Veterinary and Food Board. The possibilities of solving the problems related to supervision were partly analysed within the scope of the comprehensive food safety service and possible solutions were also suggested. We will take the recommendation of the National Audit Office on board and look for solutions to better detection and processing of origin and variety fraud and are considering the implementation of additional sanctions. **Response of the Director General of the Consumer Protection and Technical Regulatory Authority:** In response, the CPTRA states than on the basis of the legal regulation specified above, which relates to the marketing standards of fresh fruits and vegetables, the detection of origin and variety fraud concerning fresh fruits and vegetables could be a responsibility of the Agricultural Board, which pursuant to the European Common Agricultural Policy is the competent authority regarding control and supervision of compliance of the marketing standards of fruits and vegetables. The competent authority in the area of assessment of food quality and safety is the Veterinary and Food Board. In the opinion of the CPTRA, consumers have the right to demand and receive goods that comply with requirements and are safe to the health of consumers. Consumers are entitled to receive the information they need and it must be true to allow them to make informed choices and give them timely information about the risks related to goods. Goods must be offered and marketed in a manner that is honest towards consumers.
Informing consumers about food hazards **120. Recommendations of the National Audit Office to the Director General of the Veterinary and Food Board:** ▪ Present the actual data of the quantities of pesticide residues in analysed food samples to the general public and separately the 50% measurement uncertainty and the methods used to process the samples. Explanations of excess MRLs should be given on the basis of the actual lab results. ▪ Present the data of lab tests on the basis of the analyses that were actually performed. Presumptions that substances are not present if their presence is not tested should no longer be made. Residues should be presented in reports by products and countries of origin. ▪ The open data concerning food analyses (places where samples were taken, test results, etc.) should be made accessible and easy to find on the website of the Veterinary and Food Board. **points 104-119**	**Response of the Director General of the Veterinary and Food Board:** When we publish results, we present data and explain the results of the analyses to the general public in three categories: 1) the results were the identified pesticide residue was below the MRL; 2) the results where the identified pesticide residue is below the MRL considering the 50% measurement uncertainty; and 3) the results where the identified pesticide residue exceeds the MRL. The EFSA is currently developing a data publication platform, where the detailed data of the samples taken by the Member States will be accessible to everyone and machine-processable (business secrets, personal data and other delicate information will not be included in the data): https://www.efsa.europa.eu/en/press/news/190117. Therefore, the VFB doesn't find it necessary to establish a separate system for the publication of detailed data. Taking these recommendations into account requires improvement of the quality of data collection and the creation of interfaces with the laboratory of the Health Board, the laboratory of the Agricultural Research Centre and the information systems of the AB for sending and collection of the detailed data of the results of pesticide residue tests, which requires extra funding.

Recommendations of National Audit Office	Responses of auditees
Declaring food unsafe and preventing it from reaching consumers **139. Recommendations of the National Audit Office to the Director General of the Veterinary and Food Board:** ▪ In all cases where the hazardousness of tested food is assessed and notifications are submitted to the EU rapid alert system, proceed from the hazard assessment criteria given in the directive of the Director General of the VFB and the guidelines of the European Commission. ▪ Start using a risk assessment model (e.g. PRIMo) employed by the EFSA again and, if necessary, establish a national assessment model on the basis of the Estonian dietary study, which can be used to assess the quantities in which pesticide residues are consumed and the hazardousness of products. **points 121-138**	**Response of the Director General of the Veterinary and Food Board:** The VFB agrees that the practice of assessing food safety must be changed. The PRIMo model of the EFSA will be used for assessment of the hazardousness of food in terms of pesticide residues. Notifications will be sent to the RASFF according to the RASFF's "Guidelines for the calculation of consumer intake and evaluation of the risk for pesticide residues". The issue of implementing the measurement uncertainty and the use of the EFSA's PRIMo model are both explained in said guideline.

Characteristics of audit

Purpose of audit

The purpose of the food safety audit is to assess whether the activities carried out by the state help guarantee food safety and protection of the health of consumers. The audit is a supplement to the audit "Activities of the state in guaranteeing the safety of foodstuffs of vegetable origin" carried out in 2009. The audit focuses on the problems related to food of plant origin; the safety of food of animal origin has been described as much as permitted by supervision of the area.

Assessment criteria

The most important criteria of the audit are as follows:

- the MRA and VFB have identified the risks of the food sector and the actions for managing them;
- the VFB monitors and analyses food to the extent that makes it possible to make generalisations about food safety;
- the VFB performs official controls proceeding from risks and as frequently as required;
- laboratories are able to determine all significant contaminants;
- the VFB has an overview of the hazardous food that has ended up on the market and intervenes quickly to guarantee its withdrawal;
- all information about food safety (monitoring data, studies, food sample test results) are accessible to the general public, which makes consumers make healthy food choices.

Scope and focus of audit

The audit covers the period from 2009-2018, i.e. the years following the previous food safety audit.

The audit focusses mainly on the following issues:

1. Do the food safety activities of the state give the reassurance that the food offered to people is safe, and make it possible to respond adequately where required?
2. Do state agencies publish the results of food studies and systematically raise the awareness of consumers so they can make informed consumption decisions?

The following methodology was used to find answers to the principal questions:

- Document analysis. EU and Estonian legislation on food handling and safety; development plans of the MRA and VFB in the area of food; multiannual national control plan, monitoring and supervision plans; risk assessments of the VFB.
- Existence of the own control plans of companies and ascertaining the functioning of the own control system with the food information system of the VFB.
- Descriptive statistics by food groups about changes in contaminants contained in food from 2007-2017 in the VFB.
- Analysis of execution of monitoring and supervision plans on the basis of the supervision information system of the VFB, which lists the controls performed by the Board.
- Analysis of possibilities to conduct food analyses in laboratories.

- Monitoring of the website, media coverage and studies of the VFB and the Health Board. The sources where food safety was covered and which were aimed at raising the awareness of consumers were reviewed.

- Qualitative analysis of food samples. The National Audit Office took 10 samples of foodstuffs on retail sale and asked the Tartu laboratory of the Health Board to analyse these for the identification of contaminants and chemical residues. The test results were compared with the permitted MRLs (see Annex E).

The audited agencies were the Ministry of Rural Affairs, Veterinary and Food Board and the Consumer Protection and Technical Regulatory Authority. The Agricultural Board was the related authority under observation to whom the National Audit Office made no recommendations. Table 6 gives an overview of the persons interviewed during the audit.

Table 6. Interviews carried out during the audit

Interviewed persons	Agency
Olev Kalda	Deputy Director General of the Veterinary and Food Board
Heneli Lamp	Former Head of the Food Department of the Veterinary and Food Board
Kairi Ramjalg	Head of the Food Department of the Veterinary and Food Board
Kadi Padur	Chief Specialist of the Retail Trade, Organic Agriculture and Non-animal Food Bureau of the Food Department of the Veterinary and Food Board
Jaana Oona	Chief Specialist of the Retail Trade, Organic Agriculture and Non-animal Food Bureau of the Food Department of the Veterinary and Food Board
Merle Laurimaa	Chief Specialist of the Bureau of Food of Animal Origin of the Food Department of the Veterinary and Food Board
Tiiu Rand	Chief Specialist of the Retail Trade, Organic Agriculture and Non-animal Food Bureau of the Food Department of the Veterinary and Food Board
Kadi Helme	Physician at the Nutrition Clinic
Kristel Ehala-Aleksejev	Physician at the Nutrition Clinic
Sirje Potisepp	Head of the Estonian Food Industry Association
Toomas Paalme	Professor at the Department of Chemistry and Biotechnology of the Tallinn University of Technology
Raina Mõttus	Deputy Director General of the Agricultural Board
Maris Raudsepp	Head of Plant Protection and Fertilisers Department of the Agricultural Board
Katrin Kikkas	Adviser to the Agricultural Board
Riina Pärtel	Chief Specialist of Plant Protection and Fertilisers Department of the Agricultural Board
Martin Minjajev	Head of the Food Safety Department of the Ministry of Rural Affairs
Ingrid Vesmes	Head of the Food Hygiene Bureau of the Ministry of Rural Affairs
Maia Radin	Head of Food Supervision Bureau of the Ministry of Rural Affairs
Katrin Lõhmus	Head of the General Food Requirements Bureau
Margit Krieger	Head of the Internal Audit Department of the Ministry of Rural Affairs
Mari Pajussaar	Adviser to the Internal Audit Department of the Ministry of Rural Affairs
Marika Adler	Adviser to the Internal Audit Department of the Ministry of Rural Affairs
Hanna Turetski-Toomik	Head of the Market Supervision Department of the Consumer Protection Authority
Liilia Laks	Chief Inspector of the Market Supervision Department of the Consumer Protection Authority

Heli Reinet	Deputy Director for Food Safety at the Veterinary and Food Laboratory
Toomas Kramarenko	Adviser for Food Safety to the Veterinary and Food Laboratory
Mari Reinik	Manager of Tartu Laboratory of Health Board
Ilona Honga	Leading Specialist at the Tallinn Laboratory of the Health Board
Ott Laius	Head of the Department of Post-authorisation Safety of the Agency of Medicines
Heli Nõmmsalu	Chemicals Expert of the Baltic Environmental Forum

Time of completion of audit: all activities were completed in March 2019.

Audit team: Audit Manager Airi Andresson, Senior Auditor Maidu Lääne and Auditor Sigrid Rajangu.

Contact information

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An electronic copy of the audit report (pdf) is available online at www.riigikontroll.ee.

A summary of the audit report is also available in English.

The number of the audit report in the records management system of the National Audit Office is 2-1/80009/7.

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Earlier audits of the National Audit Office in the area of food safety

4 February 2009 – **Activities of the state in guaranteeing the safety of foodstuffs of vegetable origin**

All reports are available on the website of the National Audit Office at www.riigikontroll.ee.

Annex A. Toxicity of the active substances of pesticides approved in the European Union on the basis of the risk assessment by the European Food Safety Authority

Table 7. Active substances approved in the European Union and their toxicity

Toxic properties	Approved for use in the EU number of active substances	
	in conventional agriculture	in organic agriculture
total active substances approved in the EU, incl.	385	26
toxic substances, of which[1], [2]	340	10
acutely toxic (category 1 + 2 + 3 + 4, total)[3]	5 + 17 + 26 + 76, 99	0+0+2+2, 3[4]
carcinogenic (category 2)[5]	27	0
mutagenic for gametes (properties that cause DNA mutations (category 2))	2	0
reproductive toxicants (categories 1B and 2)[6]	5 and 21	0
Candidates for active substance replacement by reasons in order to replace them with less toxic ones:		
acceptable daily intake (ADI/ARfD) of chemical is small	19	0
the substance is permanent, bioaccumulative, toxic (the substance has at least two properties)	54	1[7]
reproductive toxicity (category 1B)[8]	5	0
known to disrupt the endocrine system	5	0

[1] Chemicals for which maximum consumption quantities ADI (acceptable daily intake) and ARfD (acute reference dose) have been determined because of their toxicity.

[2] Only classifications related to effects on human health have been submitted pursuant to Regulation 1272/2008, and they have at least one criterion that exists in candidates for active substance replacement.

[3] Class 1 refers to the highest acute toxicity. Some substances have several classifiers for different target effects, so the total number of compounds is smaller than the sum.

[4] Pyrethrins – group of substances of either plant origin (produced from chrysanthemums) or synthetic origin. Using the natural extract on plants is permitted (one substance) and synthetic pyrethrin may be used in insect traps (two substances).

[5] Category 2 – substances in the case of which carcinogenic effect is suspected.

[6] Category 2 – substances in the case of which there are suspicions that the change in stem cells caused by the substance is passed on to offspring.

[7] Copper, the bioaccumulation of which has been measured in river sediments and insects.

[8] 1B – presumably toxic, 2 – probably toxic.

Source: Human health implications of organic food and organic agriculture: a comprehensive review, 2017. Published in the magazine *Environmental Health* (2017; 16: 111).

Annex B. Risk assessment and unclear areas in food safety system

The effects of the chemicals in pesticides are not fully known and there are gaps in risk assessment

The maximum levels established for chemical content have been changed many times. The maximum levels have been increased and decreased, temporary levels have been set, transition periods have been given for reducing the levels or banning chemicals (see the examples of apples and rice below, which illustrate how the foodstuffs currently sold in shops may be unacceptable after the revaluation of their hazardousness).

In addition to complying with the maximum level of contaminants, we should also focus on how many chemicals are ingested with food, i.e. analyse whether and how far is the safety threshold of toxicological effects considering the eating habits of Estonian people, and prevent any risks that may emerge, especially in the situation where changing the maximum level may not always change the ADI. It's also important to know what Estonian people eat and which chemicals are the most represented via food.

Hazards may also lie in areas where we've not been able to establish limits or rules yet. An example of this is the so-called cocktail effect of the chemicals present in food. The interaction of contaminants may be considerably stronger than the effect of single contaminants consumed in small quantities[56]. Also, some people may be more sensitive to the same quantities than others. Although our food usually contains several chemicals at a time, no rules or safety thresholds have been established for the presence of several chemicals. The European Food Safety Authority (EFSA) has been trying to solve this problem for the last 15 years, but no maximum levels have been established because of the complexity of the problem and the actual hazardousness is unknown[57].

As ingestion with food is one of the ways toxic substances, which among other sources originate from the chemicals used in food production, end up in the body, the scientists of different countries have also looked for connections between the consumption of organic and conventional products and health.[58] For example, scientists have studied how the quantity of the chemicals from pesticides in the body changes depending on what kind of food the person eats, and found that significantly fewer toxic chemicals were ingested by people who eat organic food[59, 60].

Biomonitoring has also been carried out to identify the quantity of chemicals from pesticides in people's bodies. For example, the study carried out in Germany revealed that urine samples contained glyphosate residues in 99.98% of the analysed cases (2009 people). The permitted level was exceeded five times in 75% of them, and the levels were exceeded to a very large extent (up to 42 times more than permitted) in one-third of the cases. The concentrations of small children and young people were also higher[61]. A similar study was also carried out in Denmark, where the indicators of glyphosate accumulation in the body were analysed in school children and their mothers[62].

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[56] For example, insects were approached in a recent study. The study revealed that the effects of 'cocktails' of different chemicals were considerably more toxic than previously thought. See https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0212456.

[57] See https://www.efsa.europa.eu/en/topics/topic/chemical-mixtures.

[58] Human health implications of organic food and organic agriculture: a comprehensive review. 2017 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5658984/.

[59] Organic diet intervention significantly reduces urinary pesticide levels in U.S. children and adults. 2019. https://www.sciencedirect.com/science/article/pii/S0013935119300246.

[60] Quality of organic vs. conventional food and effects on health: report. Estonian University of Life Sciences, https://www.digar.ee/arhiiv/nlib-digar:103784

[61] https://www.euractiv.com/section/agriculture-food/news/overwhelming-majority-of-germans-contaminated-by-glyphosate/.

[62] Biomonitoring of Danish school children and mothers including biomarkers of PBDE and glyphosate. https://www.ncbi.nlm.nih.gov/pubmed/28306542.

Important background information that could be known in relation to food safety

A broad discussion of placing the chemicals contained in pesticides on the market, their hazardousness, the establishment of maximum levels, protection of human health and the problems associated with growing food is currently ongoing all over the world as well as at the level of the European Union and between scientists, authorities and civil associations of different countries.

- The European Parliament has seen problems in the process of authorising the use of pesticides and has started to investigate the activities of the European Commission and the EFSA in the establishment of and compliance with rules via its special committee (PEST)[63]. The special committee prepared a report, where it found that the strict protection of human health may not be guaranteed, the effects of many chemicals used is actually not known, the research carried out by chemical producers is not public and it's impossible for researchers and other interested parties to obtain information about the content of this research, the principle of caution is not adequately implemented. The issue of permitting the pesticide glyphosate on the market was also under review[64].

- The European Commission is currently reviewing the legislation and activities related to food safety and risk assessment in order to make the decision-making process more transparent and clear[65].

- Researchers have pointed out that rapid changes must be made in the manner in which food is grown to guarantee the recovery of soil, reduce environmental pollution and contribute to agriculture that spares the nature and people[66, 67, 68].

- Over 140 organisations and academicians in Europe have considered the implementation of the requirements concerning food safety and pesticides a failure and submitted a memorandum for finding quick solutions[69].

- A global discussion of the actual health effects of the pesticide most used in the world – glyphosate – is currently ongoing among scientists. The fact that the substance may be carcinogenic has raised a lot of concerns. Professor Ülo Niinemets, who has studied the topic in depth and pointed out the critical shortcomings in the reliability of scientific information, has prepared a thorough overview of the reliability of the research carried out by chemical companies (based on the example of glyphosate)[70]. Stakeholders in Europe also went to court in order to demand disclosure of information and the European Court of Justice ruled that EFSA has to

[63] http://www.europarl.europa.eu/committees/en/pest/home.html.

[64] Report on the Union's authorisation procedure for pesticides (2018/2153(INI)), http://www.europarl.europa.eu/doceo/document/A-8-2018-0475_EN.pdf

[65] https://ec.europa.eu/food/safety/general_food_law/fitness_check_en.

[66] Towards a Common Food Policy for the EU. 2019. http://www.ipes-food.org/reports/.

[67] Unravelling the food-health nexus. iPES Food, 2017. http://www.ipes-food.org/_img/upload/files/Health_ExecSummary(1).pdf.

[68] Transforming food and agriculture to achieve the SDGs. Food and agriculture organization of the United Nations, 2018 http://www.fao.org/3/I9900EN/i9900en.pdf.

[69] Civil society questions Europe's 'perfect' pesticide authorisation system, Euractive.com https://www.euractiv.com/section/agriculture-food/news/civil-society-questions-europes-perfect-pesticide-authorisation-system. The manifest can be found here: https://citizens4pesticidereform.eu/.

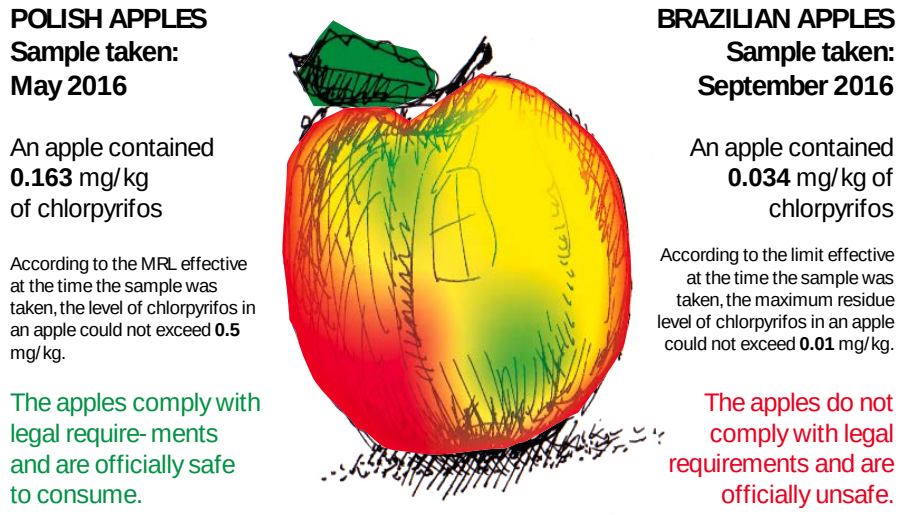
[70] Series of articles by Ülo Niinemets on the reliability of the research funded by the chemical industry. The author discusses a case that occurred in the US, where it was proven in court that the producer of glyphosate, an active substance of pesticides, didn't submit correct information about the actual health effects of this substance and organised an extensive libel campaign against the researches of the International Agency for Research on Cancer of the WHO, because the researchers had classified the substance as probably carcinogenic. See the documents of Monsanto. *Sirp* 2018–2019. http://www.sirp.ee/s1-artiklid/c21-teadus/monsanto-dokumendid-ii/.

disclose all of the scientific data related to glyphosate, so that the stakeholders could have more of a say in decision-making[71, 72].

Examples of legally compliant food, in the case of which we have no actual information about their safety or hazardousness and declaring the food safe or unsafe depend on the time when the sample was taken

Laboratory samples of two batches of apples were taken in 2016: the first from Polish apples in May and the second from Brazilian apples in September. Both apple tests indicated that the applies contained the chemical chlorpyrifos (0.163 mg/kg in Polish apples and 0.034 mg/kg in Brazilian apples). Different MRLs were in effect at the time the samples were taken: the MRL of chlorpyrifos in May was more lenient (apple could contain a maximum of 0,5 mg/kg of chlorpyrifos), but they had become stricter by September and applies could contain 50 times less of the said chemical (0.01 mg/kg). Although Polish apples contained almost five times more of the substance, the results complied with legal requirements at the time the sample was taken. Brazilian apples were declared unsafe and the sellers of the apples were issued with precepts to stop selling the apples and recall the apples that had already been sold. However, this could not be done as all of the apples had reached consumers by the time the test results arrived.

Figure 18. Example of how the permitted safe quantity of pesticide residues is almost five times smaller four months later



Chlorpyrifos is a chemical that has been used in pesticides for a long time and is meant for repelling insects. The substance is broadly used and many foodstuffs sold in Estonia contain its residues, such as apples, lemons, oranges, broccoli, tea, grapes, carrots, potatoes, rice, pears, apricots, tangerines, etc.

[71] Judgement T-716/14 of the European Court of Justice. http://curia.europa.eu/juris/document/document.jsf?text=&docid=211427&pageIndex=0&doclang=ET&mode=req&dir=&occ=first&part=1&cid=4346819.

[72] Judgement T-329/17of the European Court of Justice. http://curia.europa.eu/juris/document/document.jsf?text=&docid=211426&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=5254329.

A public discussion of the need to ban the substance in the EU and the US has been ongoing on the initiative civil associations and researchers for a long time. Withdrawal of the substance from the market because of its health effects was demanded with a court ruling in the US, as the information presented in studies was enough proof of effects to the court[73, 74]. The World Health Organisation and various studies have referred to the chemical as a cause of neurological disorders and its other possible negative effects, such as foetal abnormalities, development disorders in children, attention deficit problems and damage to the endocrine system, which may emerge if small quantities of the substance are ingested[75, 76]. The MRLs have been reduced by now due to the toxicity and harmfulness of the substance and the level of safe consumption has also been reduced. According to the EFSA, the content of chlorpyrifos in foodstuffs often exceeds the safety threshold[77]. The substance is still (at the time of the audit) permitted in the EU, incl. in Estonia.

Rice imported from Uruguay was analysed at a lab in April 2017. Residues of four active substances of pesticides were found in the rice. Among others, the rice contained 0.016 mg/kg of the banned substance tricyclazole. The effective MRL at the time the samples was taken was 1 mg/kg and everything complies with requirements.

If the same product had been analysed a couple of months later, the MRL would have been exceeded, as the MRL had been reduced by **100 times** in the meantime and the new MRL is 0.01 mg/kg.

This chemical is used against fungal diseases in third countries, but it is banned in the EU. There is no information about the actual hazardousness of the chemical, which is why the quantities in which the substance can be ingested daily with food is not known.

[73] The Most Widely Used Pesticide, One Year Later, 2017. http://sitn.hms.harvard.edu/flash/2018/widely-used-pesticide-one-year-later/.

[74] EU should ban brain-harming chlorpyrifos to protect health. https://www.env-health.org/IMG/pdf/-49.pdf.

[75] State of the Science of Endocrine Disrupting Chemicals. Summary for Decisionmakers, 2012. https://apps.who.int/iris/bitstream/handle/10665/78102/WHO_HSE_PHE_IHE_2013.1_eng.pdf;jsessionid=A7FDF042759C513D6EAA91F7AFA81910?sequence=1.

[76] Grandjean P, Landrigan PJ. Neurobehavioural effects of developmental toxicity. Lancet Neurol, 2014. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4418502/pdf/nihms-683046.pdf.

[77] The 2016 European Union report on pesticide residues in food https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/j.efsa.2018.5348.

Annex C. Maximum chemical content permitted in food in 2004 and 2018

Combinations of chemicals and foodstuffs have been selected for comparison in the table proceeding from excess levels identified in the national report on laboratory analyse of food for 2004.

Active substance	Maximum residue level (MRL, mg/kg)			Change in acceptable daily intake (ADI) 14 years[78]
	2004	2018	change in 14 years	
Dithiocarbamates* (potato)	0.05	0.3	↑	Ziram = Propineb = Thiram = Metiram = Mancozeb ↑ Maneb ↑
Carbendazim (pak choi)	0.02	0.1	↑	↓
Chlorpropham (potato)	1	10	↑	=
Imazalil (bell pepper)	0.02	0.05	↑	↓
Imazalil (orange)	2	5	↑	↓
Metalaxyl (tangerine)	0.05	0.5	↑	=
Penconazole (strawberry)	0.05	0.5	↑	=
Tebuconazole (tomato)	0.01	0.9	↑	=
Triadimenol (tomato)	0.3	0.3	=	↑
Carbendazim (bell pepper)	0.1	0.1	=	↓
Tetradifon (lemon)	0.01	0.01	=	No information
Tetradifon (tangerine)	0.01	0.01	=	No information
Biphenyl (baby food)	0.01	0.01	=	=
Imazalil (lemon)	5	5	=	↓
Thiabendazol (grape)	0.05	0.01	↓	=
Dimethoate (pak choi)	0.02	0.01	↓	↓
Bromopropylate (apple)	0.05	0.01	↓	=
Bromopropylate (peach)	0.05	0.01	↓	=
Use of the active substance of pesticides marked in red is prohibited. * The group of dithiocarbamates includes six chemicals, three of which are banned.	↑ the permitted quantity of chemicals has increased = the permitted quantity of the chemical has remained the same ↓ the permitted quantity of chemicals has decreased			

[78] If the ADIs for 2004 have not been mentioned in the EU pesticide database, the respective decisions of the JMPR (Joint FAO/WHO Meeting on Pesticide Residues) from earlier years have been used as the basis.

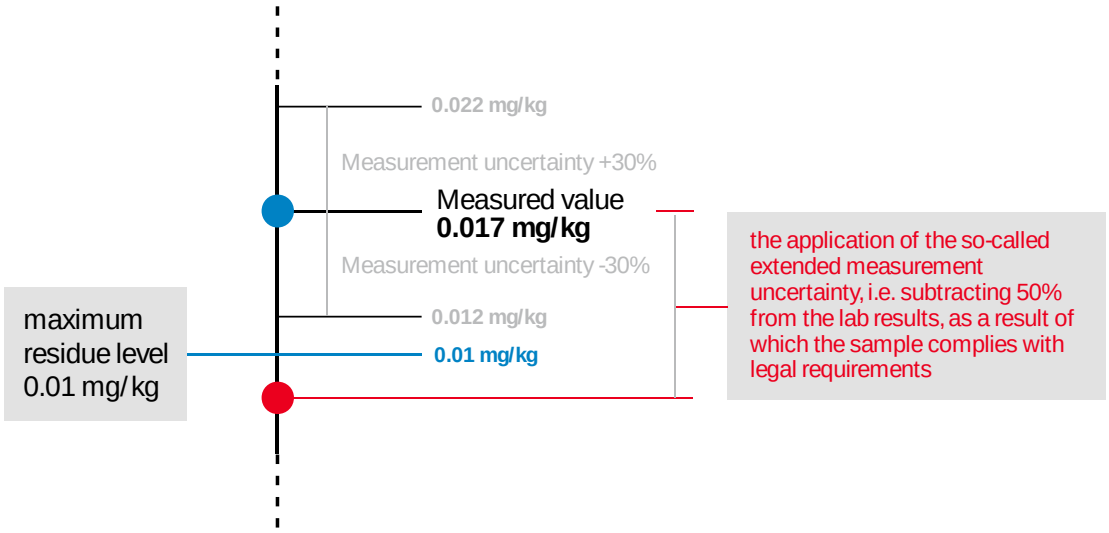
Annex D. Lab results, measurement uncertainty and maximum levels of contaminants

There isn't a single laboratory that can measure the content of a chemical in food 100% accurately. However, laboratories can tell us that the result is in a certain range. This range is called the measurement uncertainty and information about the measurement uncertainty is added to the laboratory data of each test sample.

The VFB subtracts 50% from the measurement result irrespective of the measurement uncertainty provided by the laboratory, which is called implementation of an extended measurement uncertainty, and only then compares the results with the established MRLs. If the MRL is still exceed after the subtraction, then people are informed about this (see also Figure 16) and the process of withdrawal from the market is initiated (see also points 121-139).

For example, the test of the Norwegian salmon sample ordered by the National Audit Office contained, among others, the chemical ethoxyquin[79] in the quantity of 0.017 mg/kg with the measurement uncertainty of ± 30%. This means that the content of said chemical in the fish ranges from 0.012 to 0.022 mg/kg. The MRL is 0.01 mg/kg and, considering the measurement uncertainty of the laboratory, the permitted MRL has been exceeded. The MRL in the example of the fish would not have been exceeded due to the methodology used by the VFB, as the result would be below the MRL if we subtracted 50% from the result (0.017).

Figure 19. Explanation of measurement uncertainty and so-called extended measurement uncertainty by the example of the lab test of Norwegian salmon ordered by the National Audit Office



Source: National Audit Office

[79] Ethoxyquin is an active substance of pesticides included in the list of banned substances and also a substance used as a (feed) additive, which is also banned. The substance is used in dry feed (e.g. fish, pets) as a preservative.

Annex E. Food samples taken by the National Audit Office and results of their tests in 2018

The food samples taken by the National Audit Office cannot be generalised. 66% of the nine samples tested by the National Audit Office contained pesticide residues and each of them contained one to three different residues. None of the samples exceeded the MRLs in respect of the contaminants to which MRLs has been established. MRLs had not been established for two combinations of foodstuff and chemical: there were ethoxyquin and DDT found in salmon. If we base the assessment of active substances without MRLs on the default MRL of 0.01 mg/kg, then the residue of ethoxyquin[80] and DDT exceeded the MRL. The banned substance linuron was found in one foodstuff – Estonian carrots[81]. No pesticide residues and nitrates were found in imported apples and rapeseed oil.

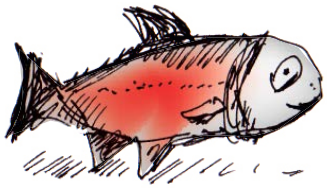
Figure 20. Test results of the food samples taken by the National Audit Office

ESTONIAN CARROT
Boscalid **0.06** mg/kg
Linuron less than **0.003** mg/kg

DUTCH CAULIFLOWER
Dithiocarbamates **0.13** mg/kg

ITALIAN ICEBERG LETTUCE
Imidacloprid **0.028** mg/kg

ESTONIAN KAMA FLOUR
Glyphosate **0.2** mg/kg



NORWEGIAN SALMON
DDT **0.02** mg/kg*
Ethoxyquin **0.017** mg/kg*

INDIAN GRAPE
Boscalid **0.058** mg/kg
Fenhexamid **4.052** mg/kg*
Fluopyram **0.117** mg/kg*

ESTONIAN WIENER
Nitrates **74.4** mg/kg
Nitrites **14.2** mg/kg

The presence of the banned substance DDT in salmon probably doesn't refer to the use of this substance, but to the residues in the environment that also accumulate in salmon via the food chain. Ethoxyquin, the second substance found in salmon, is an active substance of pesticides (fungicide and plant growth regulator) and an additive (E324), which has been used as an antioxidant in food and feed. Using the substance is banned because of its harmful effect, but a transition period has been granted until 2020. The content of ethoxyquin is not analysed in foodstuffs in Estonian food monitoring and the Tartu laboratory of the Health Board made the analysis on the order of the National Audit Office.

[80] Ethoxyquin is not in the EU list of additives, i.e. using it in food is not permitted, and it is also not a pesticide approved in the EU.

[81] Use of pesticides containing linuron was permitted in Estonia until 3 June 2018.

Annex F. Recommendations made in the audit "Activities of the state in guaranteeing the safety of foodstuffs of vegetable origin" carried out in 2009 and opinion of compliance with the requirements

Recommendations	Responses	Comments on compliance
Recommendation to the Minister of Agriculture: Reform the Plant Production Inspectorate, as a result of which the structural units related to the inspection of primary producers are moved to the VFB. As an alternative, consider making a reference in the relevant legislation (Plant Protection Act, Food Act) that the Inspectorate will perform controls of agricultural producers and take samples for the purpose of guaranteeing food and feed safety. The change will make controls more efficient and reduce the administrative burden (points 30-43).	**Response of the Minister of Agriculture:** In the opinion of the Ministry of Agriculture, the cooperation of the Veterinary and Food Board and the Plant Production Inspectorate can be made more efficient within the scope of the Administrative Cooperation Act and the supervision priorities can be specified in the multiannual national control plan. The Ministry of Agriculture will certainly consider the relevance of the proposals made by the National Audit Office in the future.	Partly completed. In 2017 audit firm PWC analysed the opportunities for optimisation of the activities of two authorities – the Agricultural Board (AB; former Plant Production Inspectorate) and the Veterinary and Food Board. An overview of the activities of the authorities was obtained during the analysis and it was proposed to move the area of organic production into the area of administration of the AB. The VFB is expected to carry out a structural reform, which the AB has already completed, after which it may be possible to merge the two authorities.
In cooperation with the Ministry of Social Affairs, include the development of the main capacity of a laboratory in testing pesticide residues. The goal should be the capacity to identify at least 400 of the active substances entered in the pesticide register of the EU (points 97-104).	The Ministry of Agriculture considers the cooperation with the Ministry of Social Affairs very important and supports the idea of increasing the number of pesticide residues that can be determined in Estonian laboratories. However, it must be kept in mind when laboratory services are concentrated into one laboratory that despite a certain overlap of the testing service, they are pesticide residue reference laboratories with different orientations: in one case the laboratory specialises in animal origin and high fat content and single residue methods and in the other case in fruits and vegetables. Therefore, the sustainability of reference laboratories and the use of scientific potential must be considered in addition to the direct economic impact when changes are planned. The Ministry of Agriculture is considering a general mapping of the lab services and plans to take the results into account when planning state budget funds.	Partly completed. The capacity of labs to determine the active substances of pesticides has increased to 400 by now. However, the present situation is such where the diagnostic equipment must be renewed, but foreign aid cannot be used for this and own funds are not sufficient for covering the costs. National laboratories are therefore optimised and this is led by the Ministry of Finance. The goal is to guarantee that all laboratories work at maximum capacity, which is not the case right now. A certain quantity of tests can also be ordered from outside.
Based on the principle of caution, raise the issue of banning the sale of the fruits and vegetables in which six or more pesticide residues can be found in the European Commission and the European Food Safety Authority. So far, decisions were made separately on the basis of single tests, but there are no provisions that currently restrict their number in food (points 71-75).	The Ministry of Agriculture shares the concerns of the National Audit Office about the presence of the residues of six or more active substances of pesticides at the same time, but on the basis of the principle of caution can support the declaration of such food unsafe in the European Commission only if there is scientific proof of the hazards. Unfortunately, the Ministry of Agriculture cannot make such decisions on the basis of emotional reasons alone. The EFSA is currently looking into options of whether and how the cumulative and synergistic effects of pesticide residues could be assessed. The EFSA is an independent research institution in giving its opinions and Estonia can therefore not influence the decisions it makes. Non-profit organisations, producers, farmers, importers and other stakeholders may also submit requests for establishment or amendment of MRLs to state authorities pursuant to Article 6(2) of Regulation (EU) No 396/2005 of the European Parliament and of the Council if sufficient proof exists. So far, no such applications have been submitted to the Ministry of Agriculture.	Not completed. Scientific research is required for restricting the interaction of hazardous substances in the EFSA. However, nobody is currently studying the effect of the interaction of chemicals on people in Estonia, as we don't have the necessary scientific capability. The EFSA is dealing with the topic slowly and no clear guidelines have been issued.

Order studies for the development of a contaminant risk analysis system and for the development of the methodology for the contamination load of food and risk assessment criteria. The data would help the VFB assess the toxicological effect of contaminants (points 24, 108-110).	Studies for the development of a contaminant risk analysis system and the development of the methodology of risk assessment criteria were included as new activities in the development plan of the area of government of the Ministry of Agriculture for 2009 within the scope of measures 4.3.3.1 and 4.3.3.4 of the Estonian Environmental Action Plan. The projects cannot be launched this year because of the restricted budget of the Ministry of Agriculture. The only source of financing set forth in the Environmental Action Plan are stage budget funds, which is why financing will be postponed until the next year.	Partly completed. The dietary study of the Ministry of Social Affairs, where the eating habits of people were assessed, was completed in 2015. This will allow us to study how many substances a person ingests with food considering their menu, and to assess the quantities of contaminants and other undesirable compounds ingested with food. The MRA has carried out four such studies of expose to substances (caffeine, nitrites, raw milk, dioxin), but the EFSA does not qualify them as risk assessments, as the quantity of date on which the studies rely is not adequate.
Publish an overview in Estonian and in the format of popular science for the general public about the results of the contamination tests conducted in Estonia. It's difficult for consumers to draw conclusions on the basis of the existing reports submitted to the European Commission (points 111 and 113).	The Ministry of Agriculture has weighed various options for informing the general public about food safety. In addition to the general information on the Ministry's website, preparations were launched in 2008 for the publication of an insert about food with a national newspaper. The insert "Tark valik – ülevaade teadliku toitumise võimalustest" (Smart Choice – Overview of Options for Eating Smartly) was published with the daily *Postimees* on 8 December 2008 (accessible also on the website of the Ministry), where the issues of pesticide residues and additives were also explained. We're planning to publish another insert like this in 2009.	Partly completed. The plan for introducing and promoting sales of Estonian food "Estonian Food 2015-2020" has been prepared. Information about healthy eating has been distributed. The requirements for special food, food additives, smoking preparations and labelling have been introduced at information days. The recommendation to publish an overview of the results of contamination tests in the format of popular science every year has not been complied with.
Publish the most important results of food control in at least one national newspaper. Inform the consumers about daily food selection and ingredients as well as cooking methods that would help reduce the risks arising from contamination (points 112-116).	We're planning to include the results of food controls and introduce daily food selection, ingredients and cooking methods in the next inserts mentioned in the response to the previous recommendation. The Ministry of Agriculture agrees with the opinion of the National Audit Office that publication of articles on these topics will help consumers make informed decisions.	Partly completed. The results of food controls have not been published in a national newspaper. The blog of the Ministry of Rural Affairs "Maablogi" (https://maablogi.wordpress.com/) was created in 2012, and it is used to introduce the Ministry and its area of government.
Recommendations to the Director General of the Veterinary and Food Board: Recognise risk-based control priorities in the multiannual national control plan, which would cover the entire food chain, and proceed from risk assessments in controls (points 14-24). Increase the efficiency of internal information exchange, which would recognise the results of the supervision carried out by the veterinary centres of all counties. Perfect the existing register of supervision of analyses with more detailed data about the results of pesticide tests (points 27-29).	**Responses of the Director General of the Veterinary and Food Board:** Official controls are already planned on risk-basis in the existing multiannual national control plan. Based on the comments made by the National Audit Office, the VBF will analyse the content of the cooperation agreement of the VFB and the TTI and make amendments to the agreement with the approval of the TTI that will specify the cooperation. The VFB will take on board the comment made by the National Audit Office about the register and will perfect it with the developer if the necessary funds are found.	Completed. The VFB has established a supervision information system (JVIS), which includes all controls and the data of lab tests. Development works started in 2012 and it started working at full volume in January 2017. The VFB is satisfied with the system, as data are easy to collate and analyse. The supervision information systems of the Agricultural Board have also been considerably updated.
Update the integrated multiannual national control plan (IMNCP) with the statistical data of the controls and analyses of the samples of pesticide residues, food additives and other contaminants for three years (points 54 and 55).	The purpose of the IMNCP is not to recognise detailed control volumes by objects of study. The IMNCP is a document that describes the general principles of official controls.	Completed. Although the MRA hasn't agreed to recognise control volumes in the IMNCP, they have been highlighted in the action plans of the VFB and more detailed information about the results is given in the IMNCP implementation reports. The controls performed and the breaches found by the Agricultural Board and the Consumer Protection Authority in

		the area of food are also highlighted in the latter.
Considering the quantity of cases where pesticides exceed the MRLs, expand the volume of pesticide monitoring by the VFB to 400 samples per year. Increasing the number of samples will make the results more reliable (points 48-50).	The VFB agrees with the claim of the National Audit Office that a bigger number of samples guarantees the reliability of the results. Unfortunately, the VFB is also responsible for monitoring in other areas and this has been taken into account in budgeting. The VFB does not consider increasing the volume of monitoring samples in one narrow area possible in the current economic situation.	Partly completed. The number of samples taken in the last three years ranges from 279-337. Every year, the VFB has requested more money for the expansion of monitoring. An extra 68,000 euros was allocated to the VFB for pesticide residue tests with the 2019 state budget.
Upon the monitoring of pesticides, comply with the requirements that arise from Community legislation concerning food controls, incl. delegation of the monitoring obligation, informing the European Commission, etc. (points 51-55).	The VFB sees no conflict with the main legislation concerning official controls in the EU, Regulation (EC) No 882/2004 of the European Parliament and of the Council on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules, upon the performance of food safety monitoring. The same is also confirmed by the EC's audits of the Food and Veterinary Board of recent years. The VFB agrees with the claim of the National Audit Office that more information can always be given to the consumers and will review its options of informing the general public better.	Partly completed. The National Audit Office saw a conflict in the fact that the supervision covered by the VFB did not cover controls of primary producers of food. The VFB should monitor and control the entire path of food from the field to the table.
Establish a working group that would study the results of testing food for pesticides, other contaminants and additives, assess their effect and provide guidelines for the development of further measures. Plant protection, food and medical researchers could participate in the working group alongside the specialists of the VFB (points 117 and 118).	The VFB supports the proposal of the National Audit Office. The establishment of a unit/committee/working group for risk assessment depends directly on the budget of the VFB. The specialists responsible for monitoring at the VFB deal with all aspects of monitoring every day and participate regularly in the relevant working groups of the EC, where the issues related to the planning of monitoring are discussed and results are analysed. The same working groups also use the relevant opinions of the EFSA. The VFB doesn't have enough funds for financing an Estonian working group in the area of pesticides.	Not completed. An Estonian working group in the area of pesticides has not been formed and it's not necessary in the opinion of the VFB, as the EFSA assesses the risks to people's health and the environment sufficiently.
In order to give more information to the consumers, inform them about the products in which residues that exceed MRLs on the website of the VFB. Inform the consumers about the origin of such products and publish the toxicological indicators and possible health effects of problematic residues and the measures taken by the VFB (points 27, 28, 109 and 115).	The VFB agrees with the claim of the National Audit Office that more information can always be given to the consumers and will review its options of informing the general public better according to the recommendations.	Partly completed. The monitoring results concerning contaminants, dioxin and zoonoses can be found on the VFB website at present. The VFB has published various notices in media, e.g. "Estonian eggs contain no fipronil" and "Estonian honey complies with requirements". Presentations have also been made at conferences. There are plans to create a new website and add news to Facebook. However, information about the persons who breach rules, places where samples were taken and lab results have not been made accessible to consumers.

Annex G. Rapid alert system for food and feed

It may be necessary to respond quickly to a hazard related to food. For example, when food is contaminated with pathogenic micro-organisms (salmonella, E. coli, etc.) or the chemical substances in food exceed MRLs or are unauthorised, then it is toxic and such food should be prevented from reaching consumers. In order to guarantee risk management and remove hazardous food from shops, the European Commission has established the Rapid Alert System for Food and Feed (RASFF).

The RASFF was established by the principle that each country that identifies a hazard sends the information via the RASFF to the European Commission, which in its turn assesses the seriousness of the hazard and decides whether further sales of the respective foodstuff must be banned or the food sent back from the border (if the food originates from outside the EU). It's presumed that information in the system changes in 48 hours.

An alert notification is sent if food or feed that is a serious hazard is accessible to consumers on the market and quick action is required. Informational notifications are issued in similar situations if the other members are not required to take quick measures, because the product is not sold on the market or the risk is not considered significant. The import prohibition (back from the border) concerns food and feed consignments that were checked on the external border of the EU, health risks were detected and the consignment was rejected. News mean other food and feed safety information, which are not forwarded as alert notifications or informational messages, but which are considered interesting to control authorities and are therefore sent to members.