

Eradication: Final report for Rabies 2018

For each approved annual or multi-annual programme Member States shall submit to the Commission by the 30 April each year an annual detailed technical and financial report covering the previous year. That report shall include the results achieved and a detailed account of eligible costs incurred (Art 14 of Regulation (EU) No 652/2014).

This form is for information only, no submission possible.

ID: 20190429-XNV1SK8Y

Country code: EE

Reporting period

From: 2018

To: 2020

Year of implementation: 2018

1. Technical implementation of the programme

1.1 Description and evaluation of the evolution of the epidemiological situation, the technical implementation of the activities foreseen under the programme and the cost-effectiveness of the programme.

1. Technical data

The first (spring) oral rabies vaccination (ORV) of wildlife campaign in buffer area was carried out from 14th to 19th May 2018. (general outline of flight-lines in spring, Figure 1 in attachment of report. Please note majority of figures, tables, charts and maps are attached to the report as unique file and referred in text of report)

The second (autumn) ORV campaign in buffer area was enforced from 17th to 22th of September 2018. (general outline of flight-lines in autumn, Figure 2 in attachment of report).

1.1. Vaccination area: While in 2011-2014, ORV was carried out in buffer-zone with neighboring infected countries- Latvia and Russia, then starting from spring 2015, due to achievement of Latvian Republic officially rabies free status in 2015, ORV has been enforced solely in buffer-zone bordering Russian Federation Leningrad Region in north-east and Pskov Region in south-east. Similar strategy was proceeded in 2018. Consequently a buffer -zone with area suitable for bait -lancing 6 100 sq km was covered by ORV. In north -east close to coast of river Narva the depth of the buffer-zone was 30 km, in south-east Estonian-Russian mainland border ORV was performed in 50 km wide area. Urban areas, roads, water bodies and wet fields were excluded from above-mentioned ORV area. Territory of the buffer- zone was divided into 28 squares, which average area 218 sq km. There has been no need to conduct emergency vaccination within

previous years nor year 2018.

1.2. Vaccine baits: according to the results of public tender launched in the beginning year 2018 the vaccine used for ORV in year 2018 was Rabitec (attenuated live rabies vaccine virus, strain SPBN GASGAS). According to the contract concluded with the winner of the public procurement company OÜ Zoovetvaru the amount of purchased vaccine baits for year 2018 was 244 000 pierces ($\frac{1}{2}$ of them for spring campaign, $\frac{1}{2}$ for autumn). Prior the vaccination campaigns samples from all batches planned for distribution (in reality 1 batch, in spring and 1 batch in autumn) in total in both times 30 baits from different stands of delivered package) of Rabitec were sent to the OIE Reference Laboratory for Rabies/WHO Collaborating Centre for Rabies Surveillance and Research Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health to control the vaccine titer accordance to the public procurement technical description. Samples were taken by representative of Veterinary and Food Board in refrigerator warehouse before start of ORV. According to the results (evaluation reports from 09.05.2018 and 23.05.2018 in spring and 07.09.2018 in fall) the vaccine batches delivered were suitable for oral vaccination. The titer detected was between 10 in stage 6.8 FFU* - 10 in stage 8.1 FFU*/dose- 10 in grade 7.236 per ml while tested the baits upon arrival in the laboratory in spring. Stability testing of baits in FLI gave favorable results: If exposed to 25°C for 7 days, the mean titer detected was 10 in grade 7.113 per ml (equal to 7,368 FFu/dose). In autumn, the titer detected was between 10 in stage 6.8 FFU* - 10 in stage 8.1 FFU*/dose- 10 in grade 7.326 per ml while tested the baits upon arrival in the laboratory. Stability testing of baits in FLI gave favorable results: If exposed to 25°C for 7 days, the mean titer detected was 10 in grade 6,950 per ml (equal to 7,204 FFu/dose) The bait casing became sticky and soft, but remained intact when exposed to 40° for one hour in both testing rounds.

An average distribution density of vaccine baits used has always been 20 baits per sq km and it was decided, that despite we have had to change the vaccine in reasons not under our control, we intend to keep all other components of ORV strategy as similar as possible compared to previous years including the density of vaccine baits. Thus, 20 baits per sq km of brand new vaccine are distributed in 2018. In the frames of spring campaign 122 400 vaccine baits and for autumn campaign 122 400 vaccine baits were distributed per approximately 6 100 sq km. In total 244 800 baits were distributed in year 2017 (please note , in the frames of both campaigns, 400 baits were delivered extra by IDT, free of charge).

1.3. Distribution: distribution of baits was performed from the small airplanes type Cessna-127 Technical parameters followed for bait - lancing : altitude form ground - 100- 150 m, flight speed - 150 - 200 km/h and distance between parallel distribution lines 550- 600 m. Distribution was performed by distributors manually through the constructed special tube inside the plane. Navigation tool used for navigation was Garmin- Aera500. This system allows recording of flight tracks and making offprint afterwards. Reports of the flight-tracks are available with underlying ground -map in Power Point format and with all flight details in GPR Track Maker (GTM fail) program. Due to large volume of GTM fails they are not included into this report, but in case Commission would like to have the corresponding data of flight tracks for more targeted control, we are ready to provide them on short notice.

1.4. Rabies surveillance and bait consumption evaluation: Continuous rabies surveillance is carried out in the total territory of the country. Samples from rabies-suspected domestic and wild animals were collected by authorized veterinarians as in previous years, but due to reorganisation of veterinar system in Estonia, majority of samples from suspected animals were collected by veterinary officials in 2018. In addition, testing material is collected from indicator animals (foxes and raccoon dogs found dead, incl. road-kills, animals behaving unnaturally) by Estonian Hunters Association and sent to the laboratory for investigations to confirm or overrule disease appearance. Surveillance is conducted throughout the country territory including ORV area with target to collect as many samples as possible from indicator animal without excluding also any suspect case. From spring 2015 all healthy hunted animals without an exception have been excluded from testing-group of surveillance. Fluorescent Antibody Test is used for laboratory investigations of virus detection as a gold standard.

Monitoring of ORV has been carried out in vaccinated buffer-zone from July 2018 to the middle March 2019. The head and blood samples are collected from hunted foxes and raccoon dogs in ORV area with density up to 4 animals per 100 km². Detection of tetracycline in teeth and bone specimens by fluorescence is carried out on these samples (up to 250 pc.); additionally age of all tested animals is determined. The enzyme-linked immune-sorbent assay (ELISA) technique is in use for testing of wildlife sera after ORV to confirm population immunity level achieved.

250 blood samples were planned to be collected for control of seroconversion.

The members of Estonian Hunters Association performed hunting and sampling from July 2018 until middle-March 2019. Samples were sent to Veterinary and Food Laboratory central laboratory in Tartu via local veterinary centers. The Veterinary and Food Laboratory is responsible for investigations of tetracycline detection, age determination, antibody titration level and virus detection.

1.5. Awareness campaign: campaign started at the time of the beginning of ORV on national TV, Estonian and Russian speaking radio-channels and in local newspapers in order to inform publicity concerning vaccination activities. Brochures in Estonian and Russian languages were elaborated in 2017, as well as

posters; also commercial radio-clip recorded for Estonian and Russian-speaking audience. Those were used also in year 2018, quantity of new posters and brochures were printed already in previous year for 2018 year`s campaign. A doomen www.marutaud.ee (rabies.ee) has been created, registered and kept active to assemble easy to understand key topics about the disease including its prevention among wild and domestic warm-blooded animals.

2. Legislation

The state programme for rabies prevention carried out in Estonia is based on the Infectious Animal Disease Control Act, the Rabies Control Rules and the state programme for infectious animal disease control. Under the state programme for rabies prevention, the state budget funds are used to cover the costs of laboratory tests of animals on rabies presence and the costs of anti-rabies vaccination of dogs and cats mainly. The only preventive method used in Estonia until autumn 2005 against rabies was the vaccination of dogs and cats, as these species are supposed to be the source of infection of humans. The cost of the vaccine is covered by the State Budget. Pursuant to the Minister of Agriculture Regulation No. 67 "Rabies Control Rules" of 20.11.2000 (RTL 2000, 120, 1876) an animal owner is required to ensure that the cats and dogs belonging to him or her are vaccinated once a year. According to amendments in above-mentioned regulation, since 20.07.09, it is allowed to make booster vaccination in accordance with instructions described in product information sheet of vaccine used, but not sparse, than 24 months have passed from last vaccination. The vaccination of farm animals that graze on woodland pastures and pastures adjacent to forests is recommended. Animals are vaccinated by veterinary supervisory officials, authorized veterinary surgeons or licensed veterinarians. In Estonia, mainly wild animals that behave unnaturally and/or enter the premises of households and are killed are tested on rabies presence. Domestic animals suspected to have rabies are also tested after death. All bovine animals with nervous symptoms who died or who are emergency slaughtered are also tested on rabies. The samples are taken and tested in the laboratory throughout the year.

According to § 10 of Rabies Control Rules for oral vaccination of wild animals the Veterinary and Food Board determines the region, time and method of spreading the vaccine bait.

Legislation concerning vaccination of wild animals against rabies:

Consolidated version of Infectious Animal Disease Control Act is available in Estonian:

<https://www.riigiteataja.ee/akt/128122017024>

Consolidated version of the Minister of Agriculture Regulation of 20 November 2000 No 67 "Rules for Rabies Control" is available in Estonian: <https://www.riigiteataja.ee/akt/129032018011>

3. Information on diagnostic tests

3.1 Tetracycline detection test

Detection of tetracycline in teeth and bone specimens by fluorescence. Tetracycline is used as bio-marker in the baits used for oral vaccination of wildlife because this antibiotic has the property to fix on growing bone and teeth. The detection method uses the fluorescence of tetracycline in ultra-violet light.

Lower jaws are collected in the necropsy room, they are cut in front of the first premolar tooth, next lower jaw is divided into two parts and only one of the canine teeth is isolated from the bone.

The sectioning is done with ISOMET diamond saw. The canine tooth is fixed by its point and transversal section is done. The cut is done between 2 and 3 mm from the end of the root. The result is acceptable when the section is 0,2 to 0,6 mm thick and when different elements may be identified such as the end of the root, pulp cavity, dentine, cementum and some pieces of bone.

The section is put on the microscope slide on a drop of buffered glycerol. Tetracycline lines will appear as more or less intense yellow lines on the bluish background. Different elements are characterised: number of lines of tetracycline, period of bait uptake, age determination according to the joined procedure.

3.2 Antibody titration

The enzyme-linked immuno-sorbent assay (ELISA) technique for testing of wildlife sera after oral vaccination – Bio-Rad kit Platelia Rabies II Ad usum veterinarum (registered diagnostic kit certified by the OIE as validated fit for the purpose 05-Jul-2007). OIE Manual (2.1.13 2011 web version)

3.3 Virus detection

Fluorescent Antibody Test (FAT) - test corresponds to the method prescribed in OIE Manual (2.1.13 2011 web version). Test uses two anti-Rabies FITC conjugates (Bio-Rad Cat. No.3572114 and Bioveta Cat. No. NP 262/E/2x1ml/GB/3)

3.4 Tests carried out in case of rabies suspicion

Fluorescent Antibody Test (FAT) - test corresponds to the method prescribed in OIE Manual (2.1.13 2011 web version). Test uses two anti-Rabies FITC conjugates (Bio-Rad Cat. No.3572114 and Bioveta Cat. No. 262/E/2x1ml/GB/3

Virus isolation on cell culture (CC) - Test corresponds to the method prescribed in OIE Manual (2.1.13 2011 web version). Test uses Murine neuroblastoma cell line (MNA).

Polymerase chain reaction (Real-time RT-PCR). - Main reference: Heaton et al., Heminested PCR Assay for Detection of Six Genotypes of Rabies and Rabies-Related Viruses, Journal of Clinical Microbiology, Nov. 1997, p. 2762-2766.

Testing procedure for samples which are tested by FAT with negative or suspicious result and had a contact with unvaccinated animal or person: additional testing by CC and RT-PCR is followed.

Testing procedure for samples which are tested by FAT with positive result: result will be reported without additional testing.

4. Data on infection

No rabies has been diagnosed since January 2011 until nowadays in territory of Estonian Republic. (see epidemiological maps of cases in 2008-2011 attached to report, figures 3-5)

There was no virus positive animal detected among suspected cases of all species nor indicator animals of small carnivores involved (foxes and raccoon dogs) in 2018.(see attached tables 1 and 6)

1.2 Details on the level of achievement of the targets set in the approved programme and technical difficulties.

Achievement of targets and technical difficulties

Oral vaccination of wildlife has been implemented since 2005 to reduce rabies cases among wildlife and domestic animals, to protect animal lives and via aforementioned, diminish threat to human health. In longer perspective, eradication of disease from territory of Republic has been the scope of program. Based on intensive surveillance data, it can be concluded, that aforementioned targets have been achieved. With the exception of the areas adjacent to the south-eastern borders with Russia, rabies cases have not been detected in the Estonian territory for already 9 years (last case in central part of Estonia was dog in Harju county in March 2008). Thereof, the only rabies cases occurred, have been three rabid foxes found in May and July 2009 in Põlva and Võru county and 1 raccoon dog in January 2011 in Põlva county in short-range (less, than 5 km) of Estonian-Russian Federation land border.

The only condition of the Terrestrial Animal Health Code Article 8.13.3 unreachable for Estonia until recent time- freedom for infection within last two-year period- was fulfilled for the beginning of year 2013.

Consequently in early April 2013 Estonia declared that as its county complies with the conditions to be considered a rabies free country in accordance with the Terrestrial Animal Health Code (2012) of OIE, the Republic has regained its rabies-free status.

To protect areas freed from rabies from re-emerging infection due to movements of infected wild animals, since year 2011 bait-lancing in a buffer zone along the borders with neighbouring countries where rabies is still present has been officiated. In years 2011-2014 buffer area covered areas with both bordering countries Russia and Latvia. Starting from year 2015 ORV of wild fauna has been carried out solely in north-eastern and south-eastern borders with Russian Federation.

No re-infection has occurred and Estonia has preserved its official rabies freedom to this day. That is why in can be concluded strategy chosen has been successful and justified.

2. Results of efficiency control

2.1. Rabies incidence

Number of positive cases decreased from hundreds to zero after the oral vaccination campaigns started in autumn of 2005 in ~2/3 part of territory of Estonia, in total territory of Estonia twice a year since 2006. (see chart 1). In 2005 rabies was diagnosed in 266 animals, in 2006 in 114 animals. In 2007 4 positive cases were diagnosed: 2 cows, badger and raccoon dog. In 2008 three positive cases were found in the beginning of the year: 1 fox, 1 dog and 1 sheep (see figure 3). In 2009 rabies diagnose was verified in three foxes (see figure 4). In year 2010, for the first time over last 42 years, no a rabies case have been found. In the beginning of year 2011 one rabid raccoon dog detected (see figure 5), until nowadays, this has been the only case diagnosed since then. Estonia was recognized officially rabies-free by OIE in April 2013 (relevant information with supporting documentation can be found in OIE bulletin no. 3, 2013, pages 58-61 <http://www.oie.int/en/publications-and-documentation/bulletins-online/>)

The number of animals from whom authorized veterinarians have collected samples for laboratory investigations due to rabies suspicion has been in continual decrease since start of ORV. Subsidizing of collection of samples from suspected wildlife from State Budget since autumn 2011 has not given remarkable effect to stop this decline. Consequently the general number of animals investigated due to rabies suspicion has remain stable in latest years and testing is more targeted to small wild carnivores. Nevertheless, as in 2015 official number of animals tested due to rabies suspicion has been relevantly low, at the beginning of year 2016 Veterinary and Food Board made written proposition to Ministry of Rural Affairs to upward remarkably price paid to official veterinarians for collection of samples from suspected wild animals. In 2018 in total 102 rabies suspected animals were tested in VFL, 81 of them wildlife. Rabies-suspicion was set up in 21 domestic animals as well, dominantly in cats, but also bovines, sheep and three dogs were suspected to be infected by rabies. (see table 1).

2.2. Collection of samples for efficiency control

Samples collection for ORV monitoring and virus surveillance was carried into force by using services of Estonian Hunters Association.

To avoid mixing up the targeted testing groups of ORV monitoring and rabies surveillance by hunters, two separate contracts have been undersigned with Estonian Hunters Association since spring 2015 and also for the year 2018.

Contract undersigned in January 2018, so called "surveillance samples contract" to collect as much as

possible head samples from the indicator animals of reservoir species (e.g. road kills, animals found dead or behaving unnaturally) in total territory of the Republic covered the period till 31.12.2018. It was targeted to collect up to 1000 head samples from suitable foxes and raccoon dogs within year 2018. To facilitate the sample collection procedure and homogenize sampling suggestible division of samples was presented in annex of the contract by counties.

Following spring ORV campaign in May a second contract limited to ORV area to collect blood and teeth samples from healthy small predators hunted to monitor ORV efficiency in vaccination area was undersigned in 5th of July 2018. By this contract, hunters collect brain samples from up to 4 healthy hunted foxes or raccoon dogs per 100 km² bait-distribution range and send to the laboratory for relevant investigations.

In the frames of first contract no. 1, so-called "indicator animals contract" in total 967 heads from indicator animals (foxes and raccoon dogs) were collected and sent for laboratory investigation from total territory of country from 01.01.-31.12.2018 among them 431 foxes heads and 536 raccoon dogs heads (see table 3). Respectively, on country level plan of sample collection was fulfilled in a level of 97 %; in county level variation was ranging from 76 % to 113%.

The quality of all brain-samples was sufficient to conduct testing for rabies virus in the laboratory.

In the frames of second contract no. 110, ORV monitoring contract, the target to sample 250 healthy indicator animals per ORV area from July 2018 to March 2019 was pursued. This target was achieved- head and blood samples from 247 animals (nearly 100%) arrived to the laboratory for the Easter holidays.

Number of foxes sampled and number of sampled raccoon dogs was 149 and 98 respectively.

The percentage of implementation of hunting-contract was ranging from 82 % to 140 % depending on county. (see table 4 and 5). The average sampling density obtained for detection of bait-uptake and immunisation-rate was 4 animals per 100 sq km.

The quality of all teeth and serum samples was sufficient to conduct adequate testing procedures neraly in all cases. As it concerns 2 raccoon samples from Tartu county, unfortunately due to human mistake made in laboratory, the heads sent to laboratory were forwarded for the incineration before sampling material was collected from them. Thus, two animals have no results of bait uptake level , but solely seroconversion results.

The data concerning sampling density obtained for head and serum samples is also analyzed in district level, but due to high volume of the material, latter is not included into this report.

2.3. Results of rabies virus detection

All animals from whom hunters submitted the samples for detection of rabies virus by FAT in year 2018 were rabies indicator animals- road kills, animals found dead, having unnatural behavior or clinical signs of illness at the time of hunting as indicated by the local veterinary center in the accompanying document.

By the information written in the accompanying document there were 559 animals found dead (including road kills), 351 animals were culled due to unnatural behavior and 57 due to obvious signs of sickness.

All 979 virus investigations (440 foxes, 539 raccoon dogs) gave negative results. (see table 6.).

The data concerning animals tested for virus investigation is also analyzed in district level, but due to high volume of the material, the outcome is not included into this report.

NB! Please note, that the number of indicator animals submitted (967) and number of indicator animals tested for virus (979) within year 2018 is not equal as due to delivery- 38 indicator animals sent to laboratory in late December 2017 were actually tested by FAT in January 2018 (with negative result); for 26 indicator animals sent to laboratory in Christmas period 2018 investigations with negative result took place in January 2019

2.4. Results of tetracycline detection

From head samples collected in ORV area in monitoring period July 2017 - March 2018, teeth-material was investigated to determine age-group of the animal and presence of biomarker. All head samples collected were suitable for detection of TC; also age-class was verified for all animals 8with exception of these two animals from tartu county, whos heads were faultily destroyed).

Investigation of these target animals proved, that 69% (range 27% - 75%) of all investigated animal teeth have showed tetracycline line with a high intensity (consumed baits). On average, 66 % of the foxes and 73% of raccoon dogs were positive for tetracycline marker (see table 7).

The average bait uptake level was 74% in adult target species and 63% in young animals (see table 8).

Tetracycline was found in 72% of examined samples taken from adult foxes and 58% of young foxes. The data for raccoon dogs were 79% for adult animals and 69% for young, respectively.

Bait uptake level in species and age-group bases can be observed in table 9.

Unfortunately, change in vaccine distributed have lead to remakable drop in bait uptake. In general it can be concluded, that an average percentage of animals consuming the bait has been 10% lower, if to compare with ORV campaigns of previous years. The setback has been quite equal in both animal species and in all age groups. The level of bait consumption between young and adult animals was in harmony with experience of former years; animals under an age of one year have had (~10 %) less oppportunity to consume the baits.

The data concerning results of TC detection in ORV area is also analyzed in district level, but due to high volume of material, outcome is not included into this report.

2.5. Humoral response

44% of 247 blood samples collected from target species in vaccinated buffer-zone areas showed rabies antibody titres higher than 0,3 EU/mL with ELISA technique. The percentage of foxes with rabies antibodies was 46% and for raccoon dogs 40%. (see table 10). In previous year spectacular results of seroconversion were met (67% as an average). If to compare this years results, with an average results obtained in buffer area, latter are slightly higher (48%) , than faced in 2018.

All collected blood-samples were accompanied with corresponding head-sample, but as two heads remained uninvestigated, it was possible to detect the age of the animal from which blood sample was collected in all occasions, with except two raccoon dogs.

Specific rabies virus neutralising antibodies were detected in 52% of adult foxes and in 50% of adult raccoon dogs. In case of young animals these figures were 39% in foxes and 31% in raccoon dogs. (see table 11). As can be followed by table 12 the percentage of adult individuals of both target species with rabies antibodies was approximately 51% and of young animals 35%. Both raccoon dogs whos age remained undetected were seroconverting in sufficient level.

The bait-uptake rate determined and the level of humoral response among adult and juvenile animals was in logical correlation. The proportion of adult versus young animals undeg 1 year age among test-group has been nearly 50%/50% as an average.

The data concerning results of seroconversion is also analyzed in district level, but due high volume of material, the outcome is not included into this report.

3. Technical difficulties

Starting from spring 2015 bordering area with Latvia was excluded from ORV area. Since then ORV campaigns have been enforced purely in areas bordering Russian Federation where from rabies could re-spread to Estonian territory otherwise.

In principal, as ORV has been enforced in stable area with well-proven methodology and trained staff used for years, it should have been one regular easy-going ORV- year. Unfortunately, as in late autumn Virbac suddenly stated they have decided to discontinue the manufacture of Rabigen SAG2 from fall 2017. As SAG2 has been the only fulfilling the criteria to be the vaccine registered as well as available in Estonia, this decision nearly resulted full stop in ORV programme of our country. The biggest challenge in year 2018 was to have at all vaccine stock to distribute, to finalize relevant tendering procedure, reach to an agreement with company providing the baits, clarifying the co-financing rate for the new bait for running year and adapt to the new vaccine bait in use. It is worth underlining, that what concerns distribution procedure used in Estonia, it is fully possible to distribute Rabitec baits in precisely the same matter as SAG2 baits (distribution density operated 20 baits per km², manual distribution from the air, employment of experienced vaccine distributors and pilots, distance between flight-lines 550-600 m, flight altitude 100-150 m, speed 160-180 km/h, GPS navigation, recording of flight tracks). Nevertheless, lower monitoring results have been met, than as an average and as in previous years. Notwithstanding, the ultimate target of ORV has been continuously achieved- no rabies infection has been detected among wild and domestic fauna since January 2011.

ORV spring campaign started in the second part of May and was enforced as planned despite of rather hot weather conditions unnatural for this time of year. Some flights at the time of autumn campaign were influenced by military exercises of Estonian Defense Forces in South-Estonia.

At the beginning of both campaigns an opening meeting for working-stuff of vaccination team was conducted where among other issues possible bottlenecks of distribution system and areas of particular importance were discussed. Also in this meeting and within all ORV campaigns long, it was stressed, that distribution activities must be enforced precisely the same way despite of change in vaccine baits. Due to tense political situation spiced by military exercises ended just before start of ORV it was expected to keep reasonable distance from Estonian-Russian border (no less, then ~600 m) while distribution of baits. Fortunately, no cross-border incident were met in year 2018.

Separating the former uniform contract with Estonian Hunters Association to collect samples from wild small carnivores for monitoring and surveillance reasons justified itself in several reasons. Testing groups have been divided in accurate ways as prescribed by EFSA scientific report from 2010- solely suspected cases and indicator animals have been tested for rabies virus and diversely from other countries, no finances have been waisted to test healthy animals shot for rabies. Also surveillance samples have been collected and tested on calendar year bases since 2016. ORV monitoring period is still initiated ~1 month from ORV spring campaign completion and lasts until the end of hunting season in next spring (March). In this monitoring period hunters succeeded to collect sufficient amount of samples in the frames of both contracts. Reformation of VFB`s and its local offices work have had negative impact on collection of samples from suspected cases, as citizens feel reluctant to inform about suspicion to veterinary officials instead of authorized veterinarians. Corrective action has been taken from year 2019 and sample collection from suspected wildlife will be done by authorized veterinarians from running year. In addition, as number of authorized veterinarian has decreased remarkably, resulting one person should handle bigger working

areas, increasing of amount of money paid for sample collection has risen as an important issue.

4. Additional information

4.1. Rabies in humans

Last human case of rabies was recorded in 1986.

According to the data of the Health Board

(http://www.terviseamet.ee/fileadmin/dok/Nakkushaigused/statistika/2017/ESTepi_detsember_2017.pdf) the number of registered animal bites in the year 2017 was 1 231, later is 6,7% lower, than in previous year. Majority of animals baiting have been dogs (67% of all cases) and cats (29%). Number of animal attacks has been in decrease since start of ORV activities. In 2001-2005 as an average ~3800 persons were attacked by animals on annual bases, but for the last five years baiting-incidences have happened more, then twice rarely, less them 1500 times per year.

4.2. Trends in population of target animals of wildlife ORV.

According to the data of the Ministry of Environment population growth of foxes was rapid in year 2008, but moderate in years 2009 to 2010. Since 2011 it has been in ongoing decrease. Hunters estimation in last three-year period verify the population decrease of foxes has been remarkable. If to compare fox hunting bag statistic in recent years, hunting bag of foxes has been in slight decrease. What concerns raccoon dogs, estimations of numbers have shown persistent increase within last half of century. Hunter's estimations in years 2011-2012 indicated population growth has stabilized and statistics in last 5 years indicate moderate decrease in latter species numerical values as well. Changes in small predator's population sizes have been influenced by numerous cases of scabies diagnosed visually in all regions of the country spread by foxes and raccoon dogs. In last years, both hunting statistics and hunters estimations reflect to remarkable decrease in raccoon dogs population. The outbreak of sarcoptic mange has been spreading more freely among raccoon dogs due to warm winters within last three years course as these species had problems to hibernate. In addition ban to feed wild boars and spread of ASF among wild boars has made feeding-table of raccoon dogs remarkably narrower. Diminshig has been a little bit slower in fox population.

These trends of population -size are based on the results of questioning of hunters in every hunting-region yearly concerning their opinion, is the trend of population growth positive or negative.

Hunting bag for foxes was 5 117 individuals and for raccoon dogs 5 781 individuals in 2018. Hunting data since 1992 up to now is visualized in chart 2 attached.

5. ORV in the territory of third country.

Despite of expectations of our Board the target to undersign the contract with Veterinary Authorities of Leningrad Region of Russian Federation has remained unachievable.

1.3 Epidemiological maps for infection and other relevant data on the disease/activities (information on serotypes involved,...) (Please attach files of data using the PDF attachment feature) Use the textbox below to provide clarifications for the maps you attach, if needed.

Surveillance tests- see Figure 6 in attachment, epidemiological map with the number of animals tested by passive surveillance presented per county. Numeric values about suspected cases and indicator animals are presented in the map. All test results were negative, so to spare map-space, relevant zeros are not marked in the map. Corresponding data is also visible in tables 1 and 6 of the attachment.

Biomarker tests- see figure 7 in attachment, data about positive TC tests and number of tests performed per county territory inside ORV area is presented in map format. More specific data is also visible in tables 7-9 in the attachment.

Serological tests- see figure 8 in attachment, data about animals seroconverting by test-results and number of tests performed per county territory inside ORV area is presented in map format. More specific data is also visible in tables 10-12 in the attachment.

ANNEX VI TECHNICAL REPORT ON RABIES PROGRAMMES

VERY IMPORTANT: Please fill out the following tables with figures corresponding to measures performed during the implementing period (1/1 to 31/12).

Table A1 - TEST FOR THE MONITORING OF VACCINATION EFFECTIVENESS

Region	Species and age	Type of test	Test description	Number of tests	Number positive	% positive
ORV area	Foxes adult	Biomarker	Tetracycline in bones	85	61	71.76 %
ORV area	Foxes juvenile	Biomarker	Tetracycline in bones	64	37	57.81 %
ORV area	Raccoon dogs adult	Biomarker	Tetracycline in bones	38	30	78.95 %
ORV area	Raccoon dogs juvenile	Biomarker	Tetracycline in bones	58	40	68.97 %

ORV area	Foxes adult	Serological	VNT/FAVN/ELISA	85	44	51.76 %
ORV area	Foxes juvenile	Serological	VNT/FAVN/ELISA	64	25	39.06 %
ORV area	Raccoon dogs adult	Serological	VNT/FAVN/ELISA	38	19	50 %
ORV area	Raccoon dogs juvenile	Serological	VNT/FAVN/ELISA	58	18	31.03 %
ORV area	Foxes unknown age	Serological	VNT/FAVN/ELISA	2	2	100 %
Total				492	276	56.1 %

Table A2 - SURVEILLANCE TESTS

Region	Animal species	Category	Test description	Number of tests	Number of cases
Estonia	Foxes	Passive	fluorescent antibody test (IF)	469	0
Estonia	Raccoon dogs	Passive	fluorescent antibody test (IF)	575	0
Estonia	Wolves	Passive	fluorescent antibody test (IF)	1	0
Estonia	Other wilds carnivores	Passive	fluorescent antibody test (IF)	10	0
Estonia	Other species	Passive	fluorescent antibody test (IF)	5	0
Estonia	Dogs	Passive	fluorescent antibody test (IF)	3	0
Estonia	Cats	Passive	fluorescent antibody test (IF)	6	0
Estonia	Domestic ruminants	Passive	fluorescent antibody test (IF)	11	0
Estonia	Pigs	Passive	fluorescent antibody test (IF)	1	0
Estonia	Foxes	Passive	PCR	2	0
Estonia	Raccoon dogs	Passive	PCR	5	0
Estonia	Other species	Passive	PCR	3	0
Estonia	Domestic ruminants	Passive	PCR	2	0
Estonia	Equidae	Passive	PCR	1	0
Estonia	Dogs	Passive	PCR	2	0
Estonia	Cats	Passive	PCR	5	0
Total				1,101	0

Number of rabies virus isolates typed for differentiation from vaccine	0
Typing results (please indicate the number of field strains/vaccine strains, and (optional) comment)	NA

Table B - WILDLIFE ORAL VACCINATION

Aerial distribution data files:

Sent via post (USB, DVD, etc...)	As PDF files with flight routes of campaigns are too big to attach we are ready to send them by e-mail on first notice.
----------------------------------	---

Description of the analysis performed by the Competent Authority on the aerial distribution data and conclusions of the assessment for the quality of the distribution:

Reports of the flight-tracks with underlying ground -map in PDF format can not be attached to the report as the total file size of the attached files should not exceed 2 500Kb and their size in total is ~3,2 Mb.
 In addition flight routes with all flight details in GPR Track Maker (GTM fail) program have been analyzed by Veterinary and Food Board one -by -one within both campaigns.
 Due to large volume of GTM data fails they are not attached to this report as well, but in case Commission would like to have the corresponding data of flight tracks for more targeted control, we are ready to provide them on short notice.
 Aforementioned files, paper reports and on the spots controls prove technical parameters of distribution flights have been fulfilled, flight -routes prescribed were strictly followed and baiting done in accordance with requirements.

Start date of First Campaign	13/5/2018	End date of First Campaign	18/5/2018
Start date of Second Campaign	16/9/2018	End date of Second Campaign	21/9/2018

Region/Area	Product used	Number of doses	Size of vaccinated area (km ²)	Distribution method
offer-zone along border with Russia	Rabitec (SPBNGASGAS)	122,000	6,100	Aerial
offer-zone along border with Russia	Rabitec (SPBNGASGAS)	122,000	6,100	Aerial
Total		244,000	12,200	

Table C - OFFICIAL CONTROL OF ORAL VACCINES BEFORE THEIR DISTRIBUTION

Number of batches distributed	Number of batches controlled by CA	Number of batches rejected
2	2	0

Batch number	Manufacturer	Sampling date	Virus titration result	Outcome of the titration
VM0110617-A	IDT	29/4/2018	7,236 log FFU/ml	Acceptable
0020318-A	IDT	26/8/2018	7,326 log FFU/ml	Acceptable

COMMENT / ADDITIONAL CLARIFICATION

Please be aware, that due to characteristics of ORV monitoring period in Estonia the numbers of samples collected and tests done in technical part of report (in particular samples collected by hunters for ORV monitoring and TC detection and ELISA-tests done on those samples) will reflect actual monitoring period of 2018 programme. Period to collect samples for monitoring ORV of 2018 programme has been from July 2018 till March 2019 (head and blood samples tested for TC and AB detection). As hunting season in Estonia starts in second half of year and ends in April next year, it has not been possible to undersign contract with Estonian Hunters Association to collect needed amount of samples (4 animals/100 km² ORV area) for the end of the year. Despite this has been a constant problem in recent years while drafting report, negotiations to have a new contract for collection of ORV monitoring samples with ending date coinciding with the end of calendar year have not been successful.

The numbers of samples collected, tests done and their costs included in the financial claim are those incurred within calendar year 2018 from 1 January 2018 to 31 December 2018.

In above-mentioned reason the figures in technical part of report and in the financial claim are not matching in all occasions.

For simplification, all sums of smaller invoices have been rounded to euros (no cents)

All main costs of Rabies programme in year 2018, including ineligible costs, are included in attachment, table 13.