**EU VETERINARY EMERGENCY TEAM (EUVET) MISSION**

**Peste des Petits Ruminants (PPR) in Greece**

1. **Period:** 24 – 25 July 2024
2. **Composition of the team:**
* European Union Veterinary Emergency Team (EUVET):

Tsviatko Alexandrov (BG)

Arnaud Bataille (BE)

1. **Places visited during the mission:**

**Day 1.** Arrival of the mission team to Athens

**Day 2.** Larisa, region of Thessaly

* Meeting with Central Competent Veterinary Authority and Local Veterinary Authority in Larisa
* Visit to non-affected sheep establishment within surveillance zone in Larisa
* Visit to first establishment infected in Larisa (ADIS/5)

**Day 3.** Athens

* Final meeting with central competent veterinary authority

Agenda and list of participants see in Annex I and Annex II

1. **Terms of reference:**
* The experts should provide scientific, technical, managerial and practical assistance on the spot on the refinement of the most suitable control and eradication measures for peste des petits ruminants (PPR) under local conditions, especially as regards preparedness, awareness activities, surveillance and coordination efforts kept ovine and caprine animals.
* The experts should report exclusively to the Commission services and the authorities of Greece. Continuous contact should be guaranteed between the team, the Commission services and authorities of Greece.
* The experts should provide a written report with conclusions and recommendations aimed to the competent authority. A report to the Commission and the Member States in the framework of the Standing Committee on Plant, Animal, Food and Feed will need to be delivered as well.
* The experts shall operate under the provisions laid down in Commission Decision 2007/142/EC and in particular based on the standard rules of procedure for groups of experts.
1. **Outcome of the mission and fact-finding summary:**

Upon invitation, the EUVET was dispatched to Greece to provide technical support on PPR in line with the terms of reference. Specific recommendations are presented in this report in relation to PPR.

During the mission, the expert team focused mainly on the following aspects:

1. How the PPR virus did came and spread on Greek territory?
2. What are the critical points and how to be addressed with the most immediate and urgent measures which need to be implemented to control the PPR epidemic.
3. What are the measures to be taken by the competent authorities in Greece to mitigate the risk of PPR virus introduction into other territories and for early detection and quick response to eventual outbreak?

***Epidemiological background and current situation.***

Till 11th July 2024 Greece had a free status for PPR and the diseases had never been recorded on the territory of the country. Between 11th July and the dates of the EUVET mission, a total of 15 outbreaks of PPR had been notified in Trikala and Larisa prefectures of Thessaly region in Greece. One suspicion in Kileler was reported during the mission and confirmed as PPR positive on 26th July.

Details on the PPR outbreaks are shown in the table and figure below.

 **Table:** Recap information on the outbreaks of PPR in Thessaly in 2024 (until 26th July) (Source: ADIS)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Reference** | **Administrative division level 2** | **Administrative division level 3** | **Species** | **Susceptible** | **Cases** | **Dead** | **Suspicion/****Start date** | **Confirmation date** |
| GR-PPR-2024-00016 | Thessaly | Kileler | Sheep/goats (mixed herd) | 620 | 1 | 1 | 2024-07-24 | 2024-07-26 |
| GR-PPR-2024-00015 | Thessaly | Farkadona | Sheep | 430 | 3 | 1 | 2024-07-22 | 2024-07-24 |
| GR-PPR-2024-00014 | Thessaly | Tempi | Sheep | 3100 | 80 | 1 | 2024-07-22 | 2024-07-24 |
| GR-PPR-2024-00013 | Thessaly | Tempi | Sheep | 322 | 30 | 1 | 2024-07-21 | 2024-07-23 |
| GR-PPR-2024-00012 | Thessaly | Elassona | Sheep | 927 | 270 |  | 2024-07-21 | 2024-07-23 |
| GR-PPR-2024-00011 | Thessaly | Elassona | Sheep | 150 | 2 |  | 2024-07-21 | 2024-07-23 |
| GR-PPR-2024-00010 | Thessaly | Elassona | Sheep | 29 | 2 |  | 2024-07-20 | 2024-07-23 |
| GR-PPR-2024-00009 | Thessaly | Elassona | Sheep | 348 | 6 |  | 2024-07-20 | 2024-07-23 |
| GR-PPR-2024-00008 | Thessaly | Elassona | Sheep | 52 | 4 | 1 | 2024-07-20 | 2024-07-23 |
| GR-PPR-2024-00007 | Thessaly | Kalambaka | Sheep/goats (mixed herd) | 11 | 5 | 2 | 2024-07-17 | 2024-07-22 |
| GR-PPR-2024-00006 | Thessaly | Kalambaka | Goats | 183 | 5 | 2 | 2024-07-16 | 2024-07-18 |
| GR-PPR-2024-00005 | Thessaly | Elassona | Sheep | 410 | 50 | 9 | 2024-07-17 | 2024-07-18 |
| GR-PPR-2024-00004 | Thessaly | Kalambaka | Sheep/goats (mixed herd) | 560 | 40 | 15 | 2024-07-15 | 2024-07-17 |
| GR-PPR-2024-00003 | Thessaly | Kalambaka | Sheep/goats (mixed herd) | 805 | 65 | 40 | 2024-07-12 | 2024-07-15 |
| GR-PPR-2024-00002 | Thessaly | Kalambaka | Sheep/goats (mixed herd) | 185 | 35 | 6 | 2024-07-12 | 2024-07-15 |
| GR-PPR-2024-00001 | Thessaly | Kalambaka | Sheep/goats (mixed herd) | 264 | 50 | 50 | 2024-07-08 | 2024-07-11 |



**Figure.** Locations of thePPR outbreaks, 11-26th July 2024

In all outbreaks, most clinical signs typical of PPR infection have been observed in sheep, rather than in goats.

***Control measures:***

Our impressions are that Greece is implementing excellent measure in terms of outbreak management without any delays. All measures as defined in the EU legislation and particularly Commission Delegated Regulation (EU) 2020/687 of 17 December 2019 supplementing Regulation (EU) 2016/429 of the European Parliament and the Council, as regards rules for the prevention and control of certain listed diseases and Commission Implementing Decision (EU) 2024/2014 of 19 July 2024 concerning certain interim emergency measures relating to infection with peste des petits ruminants virus in Greece, have been strictly implemented.

There are very strict instructions and clear documents and guidelines issued specifically for the purpose of PPR control. The Animal Health and Food Safety department had compiled and distributed to all vets and stakeholders very clear guidelines as regard to the requirements and controls in animal establishments, milk processing establishments, slaughterhouses and all aspects of the movements of small ruminants and products thereof as well as their processing. In the latest update at the time of the final meeting, the area of Thessaly was placed in a state of emergency, allowing for flexibility and quicker response when additional equipment and staff is needed to avoid any delay in control activities.

Designated milk collection trucks are moving only within the protection and surveillance zones and not collecting any milk outside of this zone. Pasteurization according to EU regulation is enforced with regular inspection of food authorities. Milk from restricted zone is delivered in close containers with details information given to milk processing establishment provided in advance to help organize controls for the following week.

Wide awareness campaign for PPR is in place. Awareness materials were distributed all over Greece immediately after the PPR detection in the country. Previously awareness campaigns for PPR have been provided under the TAD and THRACE programmes.

Killing and disposal (by burial) of the susceptible livestock, as well as proper cleaning and disinfection are performed as soon as possible for every outbreak. Some constrains with identification of place for burial were solved very quickly and did not cause any delays in the outbreak management process.

A very positive point is the political support provided by the Governor of Thessaly, and more generally by the local and central government, which is to the highest extend. Total movement ban for small ruminants was imposed on the whole territory of Thessaly (restrictions imposed beyond the protection and surveillance zones and even beyond the further restricted zone as per Decision 2024/2014). Sheep and goat slaughter is also prohibited in the region until the 26th of July. The ban for movements of sheep and goats to slaughterhouse(s) was to be discussed again on 26th July. Prohibition for movements of bovines was also imposed for Trikala and Larisa prefectures, because of common use of equipment and proximity with small ruminant farms. Police is involved and actively patrolling and controlling for any illegal animal movements. Grazing is prohibited in the whole region, with possible support to provide feed for animals under discussion.

Because of PPR notification in Romania and suspicion by Greek authorities that importation of small ruminants from Romania into Greece is at the origin of the outbreak, special controls have been put in place in all Greece in farms where sheep had been already delivered or in process arriving from Romania (but also from other states) with strict surveillance to detect or rule out any infection. Entry of animals from Romania has been prohibited in the region of Thessaly. In other regions of Greece, sheep imported from Romania intended for slaughtering had to be slaughtered separately from animal from other origins within 24h after inspection and those for other purposes had to be isolated and clinically examined regularly for at least 21 days.

There are six official veterinarians in Trikala and 14 official vets in Larisa. An additional 100 – 110 veterinarians were appointed to support the activities in the affected prefectures, including military vets, governmental vets from other counties and private veterinarians. Thirty to 40 teams are performing clinical investigations and sampling (of suspected sheep and goats) on daily basis, in the established zones. In the absence of clinical signs in some of the cases two animals were randomly selected and virologically tested.

The National Reference Laboratory (NRL) can perform laboratory investigations for 100 animals per day. The national veterinary research laboratory in Thessaloniki has been appointed to provide support to the NRL for the diagnostic tests in the course of the epidemic, under the supervision of the NRL. A third laboratory associated with the university of Thessaly, is being trained for PPR laboratory diagnostic to further increase diagnostic capacity.

***Visit 1 - The PPR free establishment:***

The establishment is located in the surveillance zone around outbreaks 2024/5. It is a fenced, intensive family dairy farm with lacaune sheep. There is no grazing at the moment, as imposed by authorities. The milk collection lorry is linked with two farms. The farmer and other staff were very well aware of the PPR situation, following it since the start of the outbreaks, and try to implement all necessary measures to their knowledge and understanding to mitigate the risk from PPR introduction. They inspect their animals several times per day. The farm has been subject to strict active surveillance performed by the veterinary authorities. Disinfection point is available at the entrance of the fence. However there is no cleaning before the disinfection activities. Wool sheering was already performed during Easter time and not considered as risk factor for the current situation. There is no changing of clothes and shoes by staff when entering the stables where the animals are. Shoes are disinfected at the entrance when entering and exiting the premises. Except the milk truck there are no other links with other establishments. Every individual animal was clinically examined in the framework of the surveillance.

***Visti 2 - Outbreak 2024/5:***

This is the first farm to be notified as infected by PPR in Larisa. At the time of our visit, the establishment was already depopulated with proper cleaning and disinfection completed. The sheep were buried on the spot. This is a farm with very limited contact with external resources. The sheep were grazed on the land owned by the farmer that is surrounded by electric fences. However direct or indirect contacts with other flocks could be possible at the fence or water pools. There is a manure storage very near the fence. The owner had not introduced any sheep recently. Furthermore it is a very rare process and happens only with high quality rams from France. Greek and Romanian sheep were never brought to this establishment. However, there are farms involved in trading in the area around the farm. The private veterinarian was called two days after the appearance of the clinical signs. He suspected bluetongue at the beginning and PPR test was performed a little bit later giving time for exposure of the clinical signs and mortality in 9 animals out of 410 (table above). According to the farmer the intensive trade with animals in the area around is considered as source of the virus. There are many wild boar in the area, within and around the fence, and it would be interesting of testing some of them for PPR for scientific purposes.

***Epidemiological considerations***

On 11th July 2024 Greece reported confirmation of PPR (outbreak 2024/1) in an establishment in Trikala prefecture (Kalambaka, Municipality of Meteora), at the PAFF Committee. This is the first ever report of PPR in the country. The first clinical symptoms were observed on 24th June. At the beginning it was considered as suspicion for bluetongue and after negative results, tests were performed for other transboundary animal diseases (TADs). The diagnosis PPR was confirmed on 11th July, 17 days after the first clinical signs were detected.

In the protection zone there are 29 establishments with about 2200 small ruminants and in the surveillance zone 170 establishments with 18 000 small ruminants.

On 15th July 2 more outbreaks in the same location, approximately 500 m for the first one, were reported. The epidemiological investigation showed that a dealer (outbreak 2024/3), at some point, sold animals to the farm of outbreak 2024/1. The dealer also sold animals to Soufli (Evros regional unit) and Argos Orestikon (Kastoria regional unit). Both locations claimed to have been checked and tested negative for PPR. On 17th July 4th outbreak was notified in Kalambaka. On 18th July 2 more outbreaks were confirmed, one in Kalambaka and one in Elassona (Larisa), 50 km to the East of the previous outbreaks and the restriction zones established. The farm of outbreak 2024/3 is the only trading farm infected out of the 7 farms notified so far in the area of Trikali, and may represent the index farm in the area.

As regards to the first outbreak in Elassona (outbreak 2024/5) it was treated as a suspicion for bluetongue first before testing and confirmation of PPR infection. This once again leads to the conclusion that PPR or any other TAD can be diagnosed with significant delays in areas where it is not expected. As explained above, this farm had no obvious link with farms infected in Trikali. Vet officers mentioned that other farms subsequently notified as infected in Elassona were involved in trade notably with Romania and Trikali area. This is to be confirmed by the epidemiological investigation based on tags of infected animals.

In Thessaly there are about 1.7 million small ruminants in about 8500 establishment and only in Larissa prefecture above 1 million small ruminants in 3500 establishments. The region is very famous with the production of feta cheese and there are in place very intensive movements of susceptible livestock and products thereof. The milk collection from different establishments is much intensified process and still in place during our visit.

All samples tested and clinical examinations performed under the THRACE and TADs programmes have been found negative by the time of the EUVET mission, suggesting that for the time being the virus is not origination from the territories of the high risk areas in the scope of the two programmes.

At this point there is no clear evidence of the real source of the epidemic in Greece. There are many movements of small ruminants form Romania (including the PPR affected regions) to Greece and all of them since 1st June are in process of checking and follow up. There are many traders and trading companies that could have contributed to disease spread to, within and out of Thessaly, and are under investigations. Illegal animal movements, underreporting and/or delay in detection of PPR occurrence, biosecurity gaps on farms and particularly related to lack or poor cleaning and disinfection of trucks (the milk collection ones) in different establishments are high risk factors to be considered.

Due to the huge workload in response to the new outbreaks and although some work has already been done on looking for possible sources of infection and links between different outbreaks, the Greek competent veterinary authority had not completed the epidemiological investigations for each of the outbreak. Finalising the epidemiological investigation for every single outbreak will provide more clarity on the source of infection and patterns of the PPR evolution in Greece.

The sequencing of a small portion of the virus collected in the first outbreak in Greece performed by the NRL shows that the virus is close (99.6%) to sequence from Georgia/2016 isolate, rather than published isolates from Anatolia. It has to be confirmed by sequencing analyses by the EURL, notably using full genome sequencing.

Although not very persistent, the PPR virus can spread both by direct and indirect means so control measures should aim to prevent both direct spread (animal to animal) as well as indirect spread (grazing sites, milk collection vehicles, traders, etc.).

The high density of establishments and susceptible livestock together with the common grazing, proximity of grazing areas, as well as the very intensive animal movements before the restrictions imposed may have contributed to further spread of the disease (animals still in incubation and not showing clinical signs) with more undetected outbreak in Thessaly and beyond. The EUVET expects that more outbreaks will show in the coming weeks.

This is why the highest priority must be first **to identify properly the really infected area(s)** as soon as possible and take all necessary actions to prevent the diseases of escaping to new establishments and territories.

1. **Conclusions and recommendations for control of PPR in Greece**

Based on the objective to control PPR in Greece, the epidemiology and evolution of this disease, the observations and information provided by the Greek colleagues during the EUVET mission, the general description of the situation and the already existing control measures and, a series of conclusions and recommendations were discussed and formulated for the control of the disease:

* 1. This was the first ever introduction of PPR in Greece (in Trikala and Larisa not previously considered as high risk areas) and veterinary services were therefore faced with an unexpected and exceptional situation.
	2. It appears that sheep are more susceptible than goats to the strain circulating in Greece, with clearer clinical symptoms and higher mortality.
	3. The Greek veterinary authorities took excellent measures in the field to control the disease. This is proved by the fact that some of the last detected infected establishments, only one or very few animals showed clinical signs (early detection). The main difficulty and challenge for eradication is the delay in detection of the first outbreaks, the high density of farms and susceptible animals in the restricted areas. This poses high risk for still existing non-detected outbreaks and further spread of the disease and generates additional challenges for the prevention of spread via indirect means. The close proximity of establishments and common grazing sites may further contribute to disease spread.
	4. The surveillance carried out under the TAD and THRACE programmes, as well as additional investigation by the competent veterinary authority show that for the time being there is no evidence for PPR in the areas under the scope of these programmes.
	5. Animal movements ban is imposed on the whole territory of Thessaly (measures stricter and beyond the requirements of the EU legislation) and we strongly recommend to maintain this measure for the time being and even expand the zone if needed till there is clear evidence of the size of the really affected area and there is not any risk of leaving outbreaks outside the area of control. In this exponential phase of the epidemic, the focus should be on preventing the disease from spreading geographically.
	6. The restriction zone around each of the outbreaks detected should be established based on a risk assessment, with appropriate size and prolongation of the measures imposed till there is clear evidence for absence of virus circulation based on documented clinical examinations and laboratory surveillance. Pasturing and sharing grazing sites must be strictly prevented.
	7. All previous (from 1st of June) movements of susceptible animals outside the established restrictions zones must be traced in priority and thoroughly investigated to rule out any possibility for or detect eventual other outbreak(s) as soon as possible.
	8. Stamping out of infected herds, in line with current EU legislation, combined with standstill and strict movement control should remain the basic method for control and eradication of PPR, at least for the time being, although the need for supplementary measures in the future cannot be excluded. For now the period between confirmation of the disease and completion of killing and disposal activities by the Greek authorities is really very short and must be kept in the same timeline.
	9. Detailed epidemiological surveys should be finalized, as soon as possible, to investigate the time and source of infection and modes of transmission for every single outbreak. For the time being there is no definitive evidence on the source of infection and how did the disease spread out through the infected territories.
	10. In the restricted zone clinical surveillance must be maintained. Sampling and testing of animals showing clinical signs must be priority. Swabs of ocular and nasal discharges are suitable samples. Lymph nodes, spleen and lungs can be collected post-mortem. As regards establishments with no clinical signs inside protection and surveillance zones, the EUVET recommends not to collect samples (as random sampling of 2 animals is inefficient), but to have them visited and examined again (preferably 7 days later)
	11. The coordination and cooperation with EURL should continue with regular consignment of samples from relevant outbreak(s) as agreed. The NRL has already showed signs of being overwhelmed with samples. Only samples meaningful for investigation should be processed by the NRLDiagnostic work should concentrate on ocular and/or nasal swabs and tissues (not EDTA blood as there is only limited presence of PPRV in blood), giving priority to animals showing clinical signs. Serology test on serum samples (cELISA) will be useful only for animals with clinical signs to help estimating the time since infection. The training of 2 additional laboratory for PPR diagnostic, under the supervision of the NRL, should reinforce the capacity of Greece to continue providing quick confirmation of cases. Use of penside or other tests can be investigated in cooperation with EURL if necessary.
	12. Clinical surveillance and passive reporting by farmers and private veterinarians is of the greatest importance for recognition of the disease and should be maintained and further enforced on the whole territory of Greece. Good disease awareness actions among the farmers, veterinarians and all other workers involved have taken place, leading to early detections of outbreaks. This awareness effort should be continued and reinforced all over the country, with updated information regarding the epidemiology of the disease. Notably vets and farmers should be aware that special care should be taken when examining goats as symptoms may be harder to identify
	13. Biosecurity measures implemented in the establishments with small ruminants have to be reinforced and verified regularly by the competent veterinary authorities. In particular, the management aspects (“software” side) of biosecurity needs to be strengthened. Awareness campaign have to be enforced including all stakeholders.
	14. Milk collection: Trucks collecting milk sometimes visit multiple establishments. It is important to realize that trucks might have visited establishments that are affected by PPR at a time when the presence of the disease had yet been detected and diagnosed. Therefore: all vehicles entering or leaving establishments across wider restriction zones should be properly cleaned and disinfected to avoid spreading of the disease.
	15. Animal dealers/ transporters have been considered by the competent veterinary authority as possible factor for the disease spread in Greece and should be carefully investigated and comply with the biosafety measures in place in the farmer’s holdings and in the slaughterhouses. Special attention must be paid on cleaning and disinfection of the trucks of these dealers/transporters with strictly controlled cleaning and disinfection before and after every delivery.
	16. In any case, it should be assumed that the fight against PPR will be a lengthy process that may take several months. Therefore, the local and central governmental institutions responsible for disease control (e.g. the competent veterinary authorities, laboratories) should be provided with sufficient financial and human resources.
	17. Vaccination. Implementation of a vaccination campaign should at least be envisaged as an additional measure if needed. In view of that it is recommended that anticipative work is done to prepare a potential vaccination campaign (possible vaccination scheme, availability and choice of vaccine etc.), including administrative procedures for purchase of a vaccine and road maps on implementation of a vaccination campaign.

***Final remark:*** *The working atmosphere during the mission was excellent. The colleagues from the Greece gave all their support and assistance to facilitate a fruitful mission. The EUVET team wishes to thank all colleagues present during our visits for their excellent contributions to the discussions which were undertaken in a very open and transparent manner. We also thank the team of interpreters who undertook their task with great professionalism and efficiency during this mission. Finally, we would like to thank Mary Giannio for her support in carrying out the mission.*

**Annex I**

**Programme for the EUVET mission in Cyprus on Sheep pox and Goat pox**

**EXPERT FIELD VISIT (EUVET)**

**Draft itinerary 23 – 25 July 2024**

|  |  |  |
| --- | --- | --- |
| **Time** | **Location** | **Comments** |
|  |
| **Tuesday, 23 July**  |
|  | Travel date of the expert team,flight to Athens,overnight in Athens | Overnight in Athens |
| **Wednesday, 24 July** |
| 7:00 -11:00  | Departure at 7 a.m. from the Ministry of Rural Development and Food, (2 Acharnon, Athens)- Travel to Larisa (trip of approximately 3,5 hours) |  |
| 11:00-12:00  | Meeting with the Local Authorities(Office of Thessalia Region) | **Opening meeting** EUVET ExpertsCentral Competent AuthorityLocal Veterinary Authority |
| 12:00 – 15:00 | Field visit 10 km away from 1st outbreak in LarisaIn Ampelia Verdikoussia (3 holdings in the same area) 3 holdings in one. Waiting for the results.  | **Field visit** |
| 15.00-17.00 | Departure for Elassona-Visit to 1st farm in domenico Elassonas (Municipality of Elassona)- duration of the trip 45 minutes approximately (the first outbreak in Larisa that was positive) |
| 18:00-22:00 | Return to Athens- overnight in Athens | Overnight in Athens  |
| Thursday, 25 July |
|  09:00 – 11:00  | Hellenic Ministry of Rural Development and Food (MRDF)46 Veranzerou atreet, 6th Floor | **Closing meeting**EUVET ExpertsCentral Competent Authorities |

**Annex II**

**Persons met during the mission**

**LIST OF ATTENDANCE TO THE MEETINGS**

**Day 1.**

* Dimitrios Kouretas (Regional Governor of Thessaly)
* Konstantinidis Athanasios (Director of the Veterinary services of the periphery of Thessaly)
* Panagiotis Tsiampalis (Veterinary services of the periphery of Thessaly)
* Aslanidou Sevasti (Head of Veterinary services in RU of Karditsa)
* Mary Gianniou (Head of Animal health Directorate)
* George Komitas (Head of Departmetn of Parassitic and Zoonotic Disease)

**Day 2.**

* Thomas Alexandropoulos (CVO)
* Mary Gianniou (Head of Animal health Directorate)
* Katerina Marinou (Head of Directorate of Animal health protection and Veterinary drugs)
* Despoina Papanikolaou (Head of Public health)
* George Komitas (Head of Department of Parasitic and Zoonotic Disease)
* Panagiota Papadaki (Department of Meat)
* Evanthia Chatzigiannakou (Department of Milk etc)