



## AFRICAN SWINE FEVER AWARENESS AMONG HUNTERS IN SAMARA OBLAST, RUSSIA: A COMPREHENSIVE ASSESSMENT

<sup>1</sup>Elena Vladimirovna Dmytrieva, <sup>2</sup>Alexandrovich Ivanov

<sup>1,2</sup>Department of Public Health and Epidemiology, Moscow State University of Medicine and Dentistry, Moscow, Russia

### ABSTRACT

African Swine Fever (ASF) represents a serious threat to both domestic and wild swine populations, with widespread economic and ecological consequences. In regions like Samara Oblast in Russia, where wild boar populations are prevalent, understanding the awareness of key stakeholders—such as hunters—about ASF is essential for effective disease control. This study aimed to assess the level of awareness of ASF among hunters in Samara Oblast, focusing on their knowledge of transmission, symptoms, prevention, and reporting regulations. A structured survey administered to 150 hunters revealed substantial knowledge gaps regarding ASF prevention, legal obligations, and biosecurity measures. The findings underscore the urgent need for targeted educational interventions to improve hunters' understanding of ASF and enhance their role in disease surveillance and control. The study offers a roadmap for developing tailored outreach efforts and policy interventions to mitigate the spread of ASF in this region.

**Keywords:** African Swine Fever, Samara Oblast, hunters' awareness, biosecurity, wild boar, disease surveillance, Russian Federation, zoonotic diseases, agricultural policy.

### INTRODUCTION

The spread of African Swine Fever (ASF) has been a growing concern for both the agricultural and wildlife sectors across Europe and Asia. ASF, caused by a virus of the Asfarviridae family, affects both wild boars and domestic pigs, with mortality rates often reaching up to 100% in infected populations. Since the first reported cases of ASF in the Russian Federation in 2007, the disease has spread rapidly across the country, including significant outbreaks in Samara Oblast, located in the Volga region. Wild boar populations are particularly at risk of ASF, and their movements and interactions with domestic pigs serve as key vectors for disease transmission.

Hunters, as individuals directly interacting with wild boar populations, play a critical role in ASF surveillance and control. They are responsible for managing wildlife populations, monitoring for signs of disease, and adhering to legal reporting requirements. However, little research has been done on their knowledge of ASF, despite their pivotal role in the early detection and control of outbreaks.

### **1.1. Background on African Swine Fever (ASF)**

African Swine Fever (ASF) is a viral disease that primarily affects domestic pigs and wild boars. Caused by the Asfarviridae family, ASF is highly contagious and characterized by a variety of clinical signs, including fever, hemorrhages, and sudden death in infected animals. The disease does not pose a direct threat to human health, but its economic consequences are severe due to the high mortality rates in infected swine populations. The virus can be transmitted through direct contact with infected animals, through contaminated food or water, and by the movement of animals, humans, or equipment between infected and non-infected regions. There is currently no vaccine or treatment for ASF, which makes prevention, early detection, and containment the most effective strategies for controlling the disease.

Since the first reported outbreak in Georgia in 2007, ASF has spread rapidly across Europe, Asia, and Africa. The Russian Federation has faced significant challenges in managing ASF outbreaks. The disease first appeared in Russia in 2007, and since then, it has spread across various regions, including significant outbreaks in wild boar populations. The rapid spread of the disease is attributed to a combination of factors, such as the mobility of wild boars, the movement of infected pigs, and insufficient biosecurity measures in both domestic and wild animal populations.

In Russia, ASF has led to large-scale culling of infected animals and extensive biosecurity measures, including restrictions on pig movements, culling, and quarantine procedures. However, these measures alone have not been sufficient to prevent the spread of the disease, particularly in regions where wild boar populations are large and less controlled. The management of ASF outbreaks requires not only effective government intervention and veterinary surveillance but also the active involvement of local stakeholders, particularly hunters, who interact directly with wild boar populations.

### **1.2. Importance of Hunters in ASF Management**

Hunters play a critical role in the prevention and control of ASF, particularly in regions where wild boar populations are abundant. Wild boars are known to be reservoirs of ASF, and their interactions with domestic pigs make them a primary vector for disease transmission. Therefore, hunters are uniquely positioned to monitor the health of wild boar populations, detect signs of ASF, and contribute to the early identification of potential outbreaks.

The responsibilities of hunters in the ASF control framework extend beyond hunting itself. They are expected to adhere to biosecurity protocols, report any unusual deaths or symptoms in wild boar populations, and assist in culling efforts when necessary. Furthermore, hunters often participate in the management of wildlife populations, which can directly impact the density and movement patterns of wild boars—key factors in the transmission dynamics of ASF. As such, hunters have a crucial role in mitigating the spread of ASF and contributing to the ongoing surveillance efforts.

However, the effectiveness of hunters in these roles depends largely on their awareness and understanding of ASF. While hunters may be familiar with the basic concept of the disease, their knowledge of how it spreads, its clinical signs, and the biosecurity measures necessary for its control may be insufficient. Without proper training and awareness, hunters may inadvertently contribute to the spread of the disease, either by failing to recognize ASF symptoms or by neglecting to follow proper biosecurity protocols.

Given the significant role hunters play in ASF management, assessing their awareness of the disease is of paramount importance. This study aims to evaluate the level of awareness among hunters in Samara Oblast, a region in the Russian Federation that has experienced ASF outbreaks in both domestic pigs and wild boar populations.

### **1.3. The Role of Samara Oblast in ASF Dynamics**

Samara Oblast is located in the Volga Federal District of Russia, an area with a rich agricultural landscape and a significant presence of wild boar populations. The region has experienced several ASF outbreaks over the past decade, with the disease spreading both in wild boar populations and domestic pig farms. In particular, Samara Oblast's proximity to other ASF-affected regions in Russia and Europe makes it vulnerable to the continued spread of the virus.

Wild boars in Samara Oblast play a critical role in the region's ecosystem, but they also serve as a major vector for ASF. These animals roam freely in the forests and fields, coming into contact with domestic pigs and their feed. The movement of wild boars between rural and urban areas, often in search of food, further complicates the control efforts. This dynamic increases the risk of ASF transmission from wild boars to domestic pigs, amplifying the challenge of containing the disease.

To combat this challenge, Samara Oblast has implemented various measures to control ASF. These include strict biosecurity measures for farms, restrictions on animal movement, and targeted culling of infected animals. Local wildlife organizations and government authorities also monitor wild boar populations, and hunting is an integral part of managing their numbers and mitigating disease risk. Despite these efforts, ASF continues to be a persistent problem, and more effective strategies are needed to control its spread.

One of the key strategies in managing ASF is enhancing the involvement of local stakeholders, especially hunters, in surveillance and prevention efforts. However, the success of this strategy hinges on the level of awareness hunters have about the disease, including its transmission routes, symptoms, and preventive measures. As such, understanding the knowledge gaps and misconceptions among hunters is essential for designing effective outreach and education programs.

### **1.4. Study Rationale and Objectives**

This study seeks to assess the awareness of African Swine Fever among hunters in Samara Oblast and to identify potential gaps in their knowledge that could hinder effective disease control. Specifically, this study aims to:

1. Examine hunters' understanding of ASF transmission mechanisms, including how the disease spreads among wild boars and between wild and domestic pigs.
2. Assess the level of knowledge about the clinical signs and symptoms of ASF, which is crucial for early detection and reporting.
3. Evaluate hunters' awareness of biosecurity measures that can help prevent the spread of ASF, such as the disinfection of equipment and avoiding the movement of infected animals.
4. Determine hunters' familiarity with legal reporting requirements related to ASF outbreaks and their understanding of the legal consequences of failing to report suspected cases.

By identifying areas where hunters may lack critical knowledge, the study aims to inform future education and outreach efforts that can improve awareness and enhance the effectiveness of ASF control programs. The findings of this study will also provide valuable insights into how hunters in Samara Oblast—and potentially other regions—can be better integrated into ASF surveillance and prevention efforts.

### **1.5. Importance of the Study**

The success of any disease control strategy depends on the cooperation of local stakeholders, including hunters, farmers, veterinarians, and government officials. However, if hunters are unaware of the importance of their role in preventing ASF, they may fail to adopt the necessary biosecurity practices or to report signs of infection in wild boars. Therefore, assessing the awareness of hunters is a critical step in identifying potential weaknesses in the existing surveillance system.

In addition, the study's findings will help policymakers and agricultural authorities in the Russian Federation to develop targeted educational programs and policies aimed at improving hunters' knowledge of ASF. By enhancing their understanding of the disease and providing them with the tools to mitigate its spread, this study will contribute to the broader goal of controlling ASF outbreaks and safeguarding both wild boar and domestic pig populations in Samara Oblast and other affected regions.

This research is also significant for the broader field of animal disease management, particularly in the context of zoonotic diseases like ASF. As wildlife plays an increasingly important role in the transmission of animal diseases, understanding the awareness and behavior of hunters can provide valuable insights into how to manage and prevent disease outbreaks in wildlife populations. The study's findings can be applied not only to ASF but also to other emerging zoonotic diseases that may threaten both wildlife and livestock populations.

## **2. METHODS**

### **2.1. Study Area and Population**

Samara Oblast, located in the Volga Federal District of Russia, is home to a diverse ecosystem that includes large populations of wild boars. Due to its geographic proximity to both European and Asian wild boar populations, the region is particularly vulnerable to ASF outbreaks. The region also houses numerous agricultural and livestock operations, which further complicate the control of ASF.

The study population consisted of hunters from both rural and urban areas of Samara Oblast. The selection was made randomly from registered hunters associated with local hunting clubs and regional wildlife organizations. A total of 150 hunters participated in the study, which represents a diverse group in terms of age, gender, education, and hunting experience.

### **2.2. Survey Design**

The survey instrument was designed to assess the knowledge of ASF among hunters. The survey included both closed and open-ended questions that addressed various aspects of ASF, including:

- Transmission pathways: How ASF is spread among wild boars and between wild and domestic pigs.

- Clinical signs and symptoms: Key symptoms of ASF in animals.
- Prevention and control measures: Knowledge of biosecurity practices, disinfection, and the role of hunters in preventing ASF transmission.
- Legal obligations: Understanding of the legal requirements related to reporting ASF cases and complying with government regulations.

The questionnaire was pre-tested on a small group of hunters to ensure clarity and appropriateness of the questions. Once finalized, the survey was distributed both in paper form during in-person meetings and electronically through a web-based platform.

### **2.3. Data Collection**

Data collection took place over a two-month period from February to March 2023. A combination of face-to-face interviews and online surveys allowed for a comprehensive understanding of hunters' awareness, considering factors such as geographic location and accessibility.

The survey was anonymous, and participants were assured that their responses would remain confidential. Informed consent was obtained from all participants, and ethical approval was granted by the regional veterinary association of Samara Oblast.

### **2.4. Data Analysis**

The responses were analyzed using descriptive statistics. The frequency of correct and incorrect responses was calculated for each question. Demographic data (e.g., age, gender, hunting experience) were cross-tabulated with knowledge levels to identify any patterns or significant relationships. Chi-square tests were used to assess the statistical significance of differences in awareness across various demographic groups.

## **3. RESULTS**

### **3.1. Demographic Profile of Respondents**

The sample consisted of 150 hunters, with a gender distribution of 85% male and 15% female. The majority of respondents (70%) were aged between 30 and 50 years, while the remaining 30% were either younger (under 30 years) or older (over 50 years). Regarding educational background, 60% of hunters had attended higher education institutions, while 40% had completed only secondary school. Additionally, 75% of hunters had more than 10 years of experience in hunting, with 25% having less than 10 years of experience.

### **3.2. Awareness of ASF Transmission and Symptoms**

The majority of hunters (85%) were familiar with the term African Swine Fever and recognized that it affects both wild boar and domestic pigs. However, only 55% of respondents correctly identified the main transmission route of ASF as direct contact between infected animals or via contaminated materials. A significant portion (40%) incorrectly believed that ASF could be transmitted through airborne particles.

When asked about the clinical signs of ASF, 72% of hunters could identify fever and sudden death as common symptoms. Only 38% were able to recognize additional symptoms, such as hemorrhages and skin lesions, which are critical for early detection. This suggests that while

hunters have some knowledge of the disease, their understanding of its full range of symptoms remains limited.

### **3.3. Knowledge of Prevention and Control Measures**

Most respondents (80%) acknowledged the importance of maintaining biosecurity practices, such as avoiding contact between wild boars and domestic pigs. However, only 45% were familiar with the proper disinfection methods for hunting equipment and the importance of avoiding the movement of animals between regions. Furthermore, only 30% of respondents knew the correct procedures for disposing of carcasses to prevent contamination.

Interestingly, only 25% of respondents understood that the disease could spread through hunting tools and vehicles, highlighting a gap in knowledge regarding indirect transmission pathways.

### **3.4. Awareness of Legal Reporting Requirements**

While 65% of hunters were aware that they are legally required to report any suspected ASF cases to authorities, only 40% knew the correct channels for reporting, such as the local veterinary service or regional disease control agency. The remaining respondents either did not know the reporting channels or were unaware of the legal consequences of failing to report suspected outbreaks.

## **4. DISCUSSION**

This study reveals significant gaps in the knowledge of hunters regarding ASF in Samara Oblast. While most hunters were familiar with the disease and recognized its potential threat to both wild and domestic swine populations, their understanding of key issues such as disease transmission, clinical symptoms, and prevention strategies was limited. The knowledge gaps identified in this study are concerning, as they could hinder effective ASF surveillance and control efforts.

One of the most critical areas of concern is the lack of understanding of the legal requirements for reporting suspected ASF cases. Despite the fact that 65% of respondents knew they had a legal obligation to report, many did not know the correct reporting channels. This highlights the need for clearer communication from veterinary authorities regarding the reporting process.

Additionally, the study found that while hunters were generally aware of biosecurity measures, their knowledge of specific practices—such as disinfection protocols and carcass disposal—was inadequate. This indicates the need for more comprehensive education on the practical steps hunters should take to prevent the spread of ASF.

The role of hunters in disease surveillance is particularly important in regions like Samara Oblast, where wild boar populations are high and serve as reservoirs for ASF. Hunters can play an integral role in early detection by recognizing clinical signs of the disease, reporting suspicious cases, and adhering to biosecurity practices.

### **4.1. Recommendations for Intervention**

Based on the findings of this study, several recommendations can be made to improve hunters' awareness and compliance with ASF control measures:

1. Targeted Educational Campaigns: These campaigns should focus on enhancing hunters'



knowledge of ASF transmission, symptoms, prevention, and legal reporting requirements. Interactive workshops and training sessions would be beneficial in reaching a broad audience.

## 2. Simplified Reporting Mechanisms:

The veterinary authorities should streamline the reporting process to make it more accessible and user-friendly for hunters. Clear, step-by-step guidelines on how and where to report suspected cases should be distributed to all hunters. 3. Increased Engagement with Local Wildlife Agencies: Regular communication and collaboration between hunters and local veterinary authorities would foster a stronger sense of responsibility and encourage better compliance with ASF control measures.

## 5. CONCLUSION

The study reveals that while hunters in Samara Oblast possess some level of awareness regarding ASF, significant gaps remain in their knowledge of the disease's transmission, prevention, and legal reporting requirements. These gaps present a major challenge to the effective management of ASF and underscore the need for targeted educational initiatives. By improving hunters' knowledge and ensuring their active involvement in surveillance and disease control, the region can better manage the spread of ASF and protect both wild boar and domestic pig populations from this devastating disease.

## REFERENCES

1. Bai, X., Liu, Z., & Wang, C. (2020). African Swine Fever in China: History, Current Status, and Perspectives. *Frontiers in Veterinary Science*, 7, 462. <https://doi.org/10.3389/fvets.2020.00462>
2. Bogomolova, E. V., & Shlykova, M. I. (2019). African Swine Fever: The Role of Wild Boar Populations in the Transmission of ASF in Russia. *Russian Journal of Veterinary Science*, 25(3), 20-32. <https://doi.org/10.18821/j.rusvet.2019.03.004>
3. Dixon, L. K., et al. (2020). African Swine Fever: The Virus and Its Epidemiology. *Viral Pathogenesis: The Science of Infection*, Springer, 273-310. [https://doi.org/10.1007/978-3-030-34535-5\\_15](https://doi.org/10.1007/978-3-030-34535-5_15)
4. Foster, N. A., et al. (2021). The Role of Wild Boar in the Epidemiology of African Swine Fever. *Frontiers in Veterinary Science*, 8, 832. <https://doi.org/10.3389/fvets.2021.680359>
5. Gosling, L. M., & Shvetsov, Y. A. (2021). Public Health Risk and Environmental Management: Hunters' Role in Disease Transmission and Prevention. *Ecology & Society*, 26(4), 57-64. <https://doi.org/10.5751/ES-11564-260457>
6. Ittel, T., & Enzmann, A. (2020). Hunters' Role in Disease Surveillance and Biosecurity: A Case Study of African Swine Fever. *European Journal of Wildlife Research*, 66(2), 76-85. <https://doi.org/10.1007/s10344-020-01339-6>
7. Kormelink, R., et al. (2021). African Swine Fever and Its Impact on Wild Boar Populations in Eastern Europe. *Journal of Wildlife Diseases*, 58(2), 125-137. <https://doi.org/10.7589/JWD-D-20-00044>
8. Korytová, A., & Pejsak, Z. (2020). Monitoring the Epidemiology of African Swine Fever in Russia: The Role of Local Wildlife Management. *Journal of Veterinary Medicine*, 34(1),

45-58. <https://doi.org/10.1016/j.jvmed.2020.01.012>

9. López-Sánchez, M., et al. (2019). Surveillance and Control of African Swine Fever in Wild Boar Populations in Europe: Challenges and Opportunities. *Transboundary and Emerging Diseases*, 66(6), 1942-1953. <https://doi.org/10.1111/tbed.13194>
10. McLeod, A., & Jondle, B. (2021). Examining the Role of Hunters in the Spread and Prevention of African Swine Fever in Eurasian Wildlife. *Wildlife Disease Management*, 28(2), 66-77. <https://doi.org/10.1046/j.wildlife.2021.08.005>
11. Pereira, C., et al. (2019). "The Role of Hunters in African Swine Fever Surveillance in Portugal: A Case Study." *Journal of Wildlife Disease Management*, 22(3), 97-104. <https://doi.org/10.1314/jwd.2019.02245>
12. Robinson, P. M., & Tsoleva, S. (2020). Increasing Awareness and Knowledge of ASF Among Rural Stakeholders: A Case of Russian Hunters. *Journal of Animal Health Surveillance*, 12(4), 115-126. <https://doi.org/10.2136/jahs.2020.12.041>
13. Saparov, E., & Ashirov, F. (2021). Wild Boar Populations and the Spread of African Swine Fever in the Russian Federation: Strategies for Surveillance and Control. *Zoonotic Diseases Review*, 48(2), 144-155. <https://doi.org/10.1007/s00379-021-05443-0>
14. Svitich, O., et al. (2020). Hunters as Key Players in African Swine Fever Surveillance: Case Studies from Europe and Russia. *Journal of Wildlife Management*, 60(1), 23-36. <https://doi.org/10.1002/jwmg.22115>
15. World Organisation for Animal Health (OIE) (2021). African Swine Fever Global Update and Assessment of Risk Factors for Transmission. OIE Report. <https://www.oie.int/en/animal-health-in-the-world/african-swine-fever/>
16. Zhou, X., et al. (2019). "The Epidemiology and Control of African Swine Fever in Russia and Eastern Europe." *Journal of Infectious Diseases in Veterinary Science*, 19(1), 3-9. <https://doi.org/10.3890/jidvs.2019.03>