PREVENTION OF CLASSICAL SWINE FEVER IN THE BORDER REGION CROATIA – SERBIA (STOP – CSF)

International Conference

PROCEEDINGS

June 7 – 8, 2012, Hotel Park, Novi Sad

Publisher / Izdavač
Scientific Veterinary Institute „Novi Sad“, Novi Sad
Naučni institut za veterinarstvo „Novi Sad“, Novi Sad

For the Publisher / Za izdavača
dr Dragica Stojanović, Senior Research Associate, Director of the Institute

Reviewers / Recezenti
Dr Ivan Toplak
Faculty of Veterinary Medicine, Ljubljana, Slovenija
Dr Emiliya Ivanova
National Diagnostic and Research Veterinary Medical Institute Sofia, Bulgaria
Dr Tamaš Petrović
Scientific Veterinary Institute „Novi Sad“, Novi Sad, Serbia

Editor in Chief / Glavni i odgovorni urednik
Dr Tamaš Petrović, Senior Research Associate

Printed by / Štampa
SAGITTARIUS DOO, Subotica

Copies / Tiraž
300 primeraka

IPA Cross-Border Program Croatia-Serbia 2007-2013

The project:

PREVENTION OF CSF SPREADING IN CROSS-BORDER REGION THROUGH IMPROVEMENTS OF SANITARY STANDARDS AND EDUCATION OF FARMERS (STOP -CSF)

SPREČAVANJE ŠIRENJA KLASIČNE KUGE SVINJA U POGRANIČNOM REGIONU KROZ POBOLJŠANJE SANITARNIH STANDARDA I EDUKACIJU FARMERA (STOP – KKS)

This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of the Scientific Veterinary Institute ''Novi Sad'' and can under no circumstances be regarded as reflecting the position of the European Union.

International Scientific Conference / Međunarodna naučna konferencija

“PREVENTION OF CLASSICAL SWINE FEVER IN THE BORDER REGIONCROATIA – SERBIA (STOP – CSF)”
„SPREČAVANjE ŠIRENjA KLASIČNE KUGE SVINjA U POGRANIČNOM REGIONU HRVATSKA – SRBIJA (STOP – KKS)“

The Scientific Committee:

Dr Tamaš Petrović (Chairman), Scientific Veterinary Institute Novi Sad, Serbia,
Dr. Stefanie Schmeiser, Community Reference Laboratory for CSF, Institute for Virology, University of Veterinary medicine, Hannover, Germany,
Dr. Lorena Jemeršić, Croatian Veterinary Institute, Zagreb, Croatia,
M.Sc. Vesna Milićević, Scientific Veterinary Institute Serbia, Belgrade, Serbia,
Dr Ivan Toplak, Veterinary faculty, National Veterinary Institute, Slovenia,
Dr Eveline Wodak, Institute for Veterinary Disease Control, Mődling, Austria,
Dr Vilmos Palfi, Central Veterinary Institute, Head of Virological Department, Budapest, Hungary,
Dr Emiliya Ivanova, National Diagnostic and Research Veterinary Medical Institute, Sofia, Bulgaria
Dr Daniel Donescu, Institute for Diagnosis and Animal Health, Bucharest, Romania
Dr Igor Džadžovski, Faculty for Veterinary Medicine – Skopje, FYR Macedonia
Dr Dragan Kasagić, Veterinary Institute "Dr Vaso Butozan" Banja Luka, Republic of Srpska, Bosnia and Herzegovina
Prof. Dr. Bosiljka Đuričić, Faculty of Veterinary Medicine, University of Belgrade, Serbia
Prof. Dr. Mladen Gagrčin, Department for Veterinary Medicine, Faculty of Agriculture, University of Novi Sad, Serbia
Dr Sava Lazić, Scientific Veterinary Institute Novi Sad, Serbia

The Organizing Committee:

Dr Sava Lazić (Chairman), Scientific Veterinary Institute Novi Sad, Serbia;
Silva Wendling, Osijek-Baranja County, Croatia;
Dr Dragica Stojanović, Scientific Veterinary Institute Novi Sad, Serbia;
M.Sc. Budimir Plavšić, Veterinary Directorate, Ministry of Agriculture, Trade, Forestry and Water Management, Republic of Serbia;
Dr Tamaš Petrović, Scientific Veterinary Institute Novi Sad, Serbia;
Dr Branka Vidić, Scientific Veterinary Institute Novi Sad, Serbia;
Dr Dušan Orlić, Scientific Veterinary Institute Novi Sad, Serbia;
M.Sc. Radoslav Došen, Scientific Veterinary Institute Novi Sad, Serbia;
M.Sc. Ivan Pušić, Scientific Veterinary Institute Novi Sad, Serbia;
Jovan Kvaščev, Scientific Veterinary Institute Novi Sad, Serbia;
Josip Lovković, Osijek-Baranja County, Croatia;
Tomislav Petric, Osijek-Baranja County, Croatia;
Gordana Stojanović, Regional Development Agency of Slavonia & Baranja, Croatia
Arleta Kovač, Regional Development Agency of Slavonia & Baranja, Croatia

Održavanje Koferencije i štampanje Proceedingsa je podržalo Ministarstvo prosvete i nauke Republike Srbije

BIOSECURITY MEASURES IN VILLAGES AND RURAL HOUSEHOLDS

Radoslav Došen[1], Jasna Prodanov-Radulović[1], Ivan Pušić[1], Mladen Gagrčin[2]

1. Scientific Veterinary Institute "Novi Sad", Novi Sad, Serbia
2. Department for Veterinary Medicine, Faculty of Agriculture, University Novi Sad, Serbia

Abstract

Only healthy pigs can provide profitability and safety of food for consumers of pork meat and products. Pandemic H1N1 outbreak in 2009 and initial controversies on the possible role of pigs in virus transmission prompted the Food and Agricultural Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE) and the World Bank to give the highest priority to developing instruments for improving biosecurity in pig production.

The main goal of biosecurity measures is to limit transmission of swine diseases, and to reduce the impact of infectious diseases to pig production and associated economic losses. These measures directly rely on scientific knowledge of the epidemiology and transmission of key swine pathogens. Classical swine fever is designated as a List A disease by the Office International des Epizooties (OIE).
CSF has an extremely high potential for rapid transboundary spread and great significance from the standpoint of international trade in animals and products of animal origin (OIE, 2001). Infections diseases pose potential danger for the farmers, increase the risk of economic losses, significantly affect the living of inhabitants in rural areas and exacerbate poverty particularly among small-scale pig producers. Control of such diseases primarily depends on the agent virulence, number of exposed animals, specific production conditions in particular regions, economic strength of the country, etc. Countries able to accomplish international standards in the control of infectious diseases can improve their access and competitiveness in the international market of livestock and products of animal origin.

Key words: biosecurity, classical swine fever, village, rural household

Introduction

Good health status of animals in the pig sector is the first step towards the good production results because the health significantly affects both the production volume as well as the product quality. Introduction of zoonotic infection on the farm may lead to disease outbreak within animal population and, even more importantly, may endanger the excellent reputation of pork in the marketplace (1).

Biosecurity measures are aimed at reducing the spread of swine diseases, reducing effects of infectious diseases on pig production and economic losses associated with such diseases. The foundations of biosecurity derive from scientific knowledge of the epidemiology and transmission routes of key pathogens (7). Biosecurity is not of importance only in case of epidemic outbreak, but should also be routinely applied with respect to all most important swine diseases. Hence, the

different partners of the pig industry as well as the citizens should be aware of biosecurity measures and show responsibility with regard to their application (10).
Classical swine fever (CSF) is designated as a List A disease by the *Office International des Epizooties* (OIE). CSF has an extremely high potential for rapid transboundary spread and great significance from the standpoint of international trade in animals and products of animal origin (OIE, 2001).

Biosecurity is defined as a control of health status and an effective implementation of measures that aim to prevent introduction and spreading or new infectious agents into the herd (2). Biosecurity measures should prevent introduction of pathogens onto the farm (external biosecurity) as well as spreading of infectious agents to the non-infected animals when the disease is already present on the farm (internal biosecurity).

Pathogen transmission and development of the disease

The transmission occurs most commonly through trade of incubating or persistently infected pigs. Furthermore, the transmission is associated with contact with humans, transportation vehicles, feeding swills, contact with wild animals and other animals in the household. Possible transmission may occur by aerosol route, mechanical transmission via the arthropods (ticks and other arthropods), birds, pets, rodents, manure, genetic material, i.e. artificial insemination. The so called "neighbourhood infections" play an important role in the transmission of CSF virus, particularly when speaking of most recent epidemics in the EU (5, 18). This includes farms with an infection of unknown origin, which are located in immediate vicinity of herds with previous history of infection. Such "neighbourhood infections" alone are not the only transmission route; however, they refer to a range of possible transmission routes that account for virus spread over a short distance, including human contacts, air currents, rodents and birds. Identification and understanding of all factors contributing to the risk of virus introduction are essential for application of preventive actions that are epidemiologically effective and economically feasible (4).

If the infective agent is present in the faeces, saliva, nasal secretions, blood, milk or semen it can be mechanically transmitted to other animals, as well as to premises and equipment, including the contaminated protective clothing, boots, vehicles, equipment, bedding and feed. Persistence of the infectious agent on the equipment is determined by pathogen species and environmental conditions such as temperature, exposure to UV irradiation, effectiveness of disinfection procedure. Parvovirus (PPV) and Circovirus (PCV2) are highly resistant and can persist in the environment even for several months. Porcine Reproductive and Respiratory (PRRS) Virus can survive several weeks in the premises. The causative agent of dysentery (*Brachyspira hyodysenteriae*) may persist up to 40 days in moist faeces (16).

The principal goal of biosecurity measures is to prevent introduction of disease agents on the farm. All participants involved in the production process must be aware of the possibility of rapid spread of infection within the pig population on the farm and thus strictly follow the biosecurity protocols.

Influence of production structure and different production systems

The risk of introduction of an infective agent, spreading routes and strategy of biosecurity measures depends on the pig production structure in the country or particular region, as well as on the production system on the farm. Economy, agriculture, animal husbandry and rural areas in the developed countries underwent dramatic and rapid changes during the last 20 years. Changes in agriculture are reflected in the transformation of animal husbandry system, such as decreased number of farms and households and increase number of animals in the herds. Furthermore, the profitability and output per animal have increased, as well as investment in infrastructure, technology and equipment, management genetics and nutrition (17).

For example, according to the Danish Central Husbandry Register (CHR), there were 19362 pig farms in 2003. Out of the total number, 9049 and 9300 were registered to purchase weaners and finishers, respectively. The remaining 1013 farms most probably included production facilities for weaners (7-30 kg), which could be newly registered (i.e. not yet loaded) or locations that are currently empty - without pigs (3).

In the last 20 years, the control of the major swine diseases and some transboundary diseases was accomplished in developed countries. This resulted in reduction in animal health expenses and increase of efficacy of animal husbandry in these countries. Regions with unknown or indeterminate health status are generally characterized by poor management and veterinary service, and animal husbandry is mainly limited to extensive systems and pasture. Such regions are mostly poor developing countries, isolated and excluded from the international animal market (17).

In Serbia, the pig production is mostly limited to small, family owned farms. During last two decades, a number of commercial family owned agricultural households have been established, which have increased their resources and capacities significantly above the average level of small households. A part of livestock production is conducted at farms mainly owned by large companies, which bought the former state-owned farms in the privatization process during past several years of transition.

According to the records of the National Bureau of Statistics of the Republic of Serbia, the number of pigs in Serbia in 2007, 2008 and 2009 was 3.8, 3.6 and 3.5 millions, respectively (15). The data obtained in the census dated 2002 indicated that pig production is mainly performed at small family-owned agricultural households. The total number of agricultural households involved in pig production is somewhat above 400,000. In 2008, the average number of pigs (all categories) was nine animals per household (14). Such a large number of farms with small number of pigs make permanent and effective health control very difficult. Out of 11,951 households 810 (0.73%) are characterized as commercial farms, 255 (0.23%) as family farms A, 37,555 (33.55%) family farms B, 73,252 (62.43%) as backyard holdings, whilst 79 (0.07%) of owners kept pigs outdoor (Ostojić, 2012 – personal communication)

The structure of pig production in our country reveals significant variations between the regions. Some regions (Požarevac, Jagodina, Kruševac) are characterized by intensive weaner production, whereas fattening pig production

predominates in some areas (Srem). Production conditions in both regions are generally poor. Some regions (Bačka) are characterized by high density of large-capacity farms and satisfactory production conditions

Accordingly, pig trade has been intensified and contributed to the transmission of the infection between the regions. In 2002, CSF was transmitted via the transportation vehicles from the region of Jagodina and Lozovik to Bačka, and from Golubinci to Kuzmin. Thus, obtaining of prompt, reliable and detailed information on the transportation routes and contact farms is of paramount importance for disease prevention. Contract pig fattening presents a particular problem from the epizootiological point of view. Namely, weaners are obtained from different regions and from various small-scale producers (often on cattle market) thus posing potential danger of introducing and spreading of CSF and other infection. An example is transmission of CSF by transporting infected weaners from the region of Jagodina to Čurug in 2002. On that occasion, over 1,000 weaners were slaughtered with an aim of eradication of the disease.

Raising pigs in the forest

In some regions of our country, particularly near the big rivers, farmers raise domestic pigs on a grassland in forests. Such way of raising promotes the infection transmission. At the location near river Sava we have identified seven herds of domestic pigs including about 1,000 animals of all age categories, which belonged to several owners. The pigs were free to move around the forest, thus enabling immediate contact with feral pigs and other animals. In fall, all pigs are returned to their owners and penned. The role of feral pigs as a virus reservoir and possible source of infection in domestic pigs is rather evident. This is supported by numerous reports on epizootiological links between CSF in wild and domestic pigs that were published in the past few years. Epidemiological and phylogenetic research revealed that CSF virus could circulate and persist for years in some feral pig populations. CSF is introduced into the susceptible wild pig population commonly via the contaminated feed, e.g. swill or garbage containing infected material (animal entrails) disposed at public dumps or cemeteries (11). On the other hand, viremic wild pigs can freely move and thus transfer the infection between the neighbouring geographic areas.

Collecting waste for feeding pigs

Collecting of waste material for feeding pigs (gleaning of corn and other crops, food-leftovers from garbage containers, etc.) carries the highest risk of outbreak of CSF and other infectious diseases. Such feeding practice does not enable any control over contact with other animals, rodents and birds, thus providing favourable conditions for disease transmission. This pig-raising system is the most problematic one. At one hand, farmers ramble to collect the waste and at the other hand they let the pigs move freely around the household, in the forest or grassland. This severely affects the implementation of effective biosecurity measures. However, some simple and cost-effective measures are still applicable (7).

Swill feeding

Feeding swills is prohibited by most national laws. However, in developing countries slops and waste from restaurants and kitchens are used to feed pigs because of high energy and protein content, which allows short fattening period. If

used for pig feeding, swills must be heated, i.e. pre-cooked at minimum 100 °C for 1 hour.

Introduction of healthy pigs into the village

The village should be considered as a unique epidemiologic unit. The pigs within a village have usually been born and bred in the village, commingle, and thus assumed to have the same health status. The pigs introduced into a village must be of disease-free status, and particular attention is needed when they are purchased from a market. Appropriate documentation on the health status is necessary, confirming the disease-free status and origin from the infection-free territory. Such pigs should undergo a period of 30-day quarantine. During quarantine, the animals should be observed frequently for signs of disease. Quarantine should take place in a separate facility, such as at the periphery of the village, to avoid potential contamination of the entire pig population in the village.

Appropriate clothing and footwear as well as careful cleaning and disinfection must be ensured. There is also concern over sows and boars that are moved from one location to another for mating. It is most important to know the health status of the boars. Some farmers specialize in boar keeping; in such situation, it is essential to avoid multi-village pig contacts.

Trade of sick pigs

It is not uncommon for some farmers to sell animals for slaughter as soon as disease is suspected. Such practice poses a serious risk, particularly when they are sold at live-animal markets, as these animals can shed infectious agents to other animals. Furthermore, sick animals may transmit zoonotic diseases to humans, and children, pregnant women and senior citizens are at highest risk. Despite the financial implications, it will have for poor farmers, the sale or consumption of sick animals must be banned and actively discouraged. Potential customers must be informed that an inexpensive pig for sale is likely to be sick (7).

Disposal of carcasses

The Regulation on safe disposal of animal carcasses and waste of animal origin, on conditions to be fulfilled by facilities for collecting, safe removal and diagnosing of cause of death and vehicles for transportation and handling animal carcasses and waste of animal origin (13) prescribes that the holder is obligated to report the death of the animal and to submit the waste of animal origin to the relevant authority to the purpose of its safe disposal and elimination. The holder must not skin, open or cut the animal carcass. The relevant legal body must appoint the competent authority for receiving reports on animal death, transportation of animal carcasses to the collecting facility (or autopsy facility, processing plant etc), as well as to provide disinfection of the premises or location at which the carcass was found. However, the everyday practice is somewhat different and farmers face serious problems with disposal of animal carcasses. The problem of uncontrolled animal graveyards is considerable, because the holders dispose the animal carcasses into/nearby the common graves and hols (mostly not fenced) before CSF has been diagnosed. Sometimes we can witness the disposed carcasses in canals of by the roads. Same problem occurs at large-scale farms, which dispose large number of

dead animals into the shallow unfenced "grave holes". The corpses are accessible for wild animals, rats, dogs and cats that can be mechanical vectors of the infection. Local authorities must prevent and control the illegal trade of dead animals, which could have a serious impact on consumers' health and confidence in pork products (7).

Cleaning and disinfection

Prevention measures are not applicable in an environment where pigs are free to roam without their owner's control and housed only at night. Night shelters should be and disinfected. The same applies to the equipment used, particularly if it is shared with other pig keepers.

Compensation of losses and proper informing

Timely disease reporting by the farmer is of crucial importance in prevention of CSF transmission and spread. Prompt, effective and objective compensation of losses resulting from the disease on the farm would ensure prompt reporting of the disease outbreak by the holder. Farmers sometimes hesitate to provide information and are reluctant to inform on neighbours. They have fear of potential lawsuits or from persons who purchased infected livestock from them, or merely mistrust government agencies. Therefore, securing the trust and co-operation of the pig farmer is vital (6).

Location and fencing of the household / farm

The location of the farm is an important factor when speaking of disease introduction. When a new farm is being installed, even a small-scale one, the distance to other pig farms and public roads must be taken into consideration. It is essential to consider the minimum distance to the nearby neighbouring pig farms, to limit the risk of aerosol disease transmission. Key factors dictating the risk of introducing disease into the herd are geographic location of the farm and proximity of other live pigs. Moreover, the number and density of pig units within a 2 km radius are crucial.

Ideally, new pig units should be positioned in regions of low pig density away from known risk factors such as other live pigs, slaughterhouses, slurry lagoons, refuse tips and roads used by pig transporters. A safe distance between pig farms should be at least 500m (16). Farm units or enclosures should be completely fenced, and the fence must be designed to prevent the entry of wild animals, including wild boars and feral pigs. Contact with birds should also be prevented, by using nets on the roof and open sides. The access to the farm must be strictly controlled, and entrance clearly identified.

Visitors

Visitors should always be asked whether they have recently been to potentially contaminated places, such as pig farms, slaughterhouses, markets, post-mortem rooms. If they have, they should not be admitted to the farm unless all appropriate biosecurity measures are taken. Very often farmers skip to change their clothes and footwear after working with pigs. Specific clothing and footwear, which is used only at this farm, should be provided for all visitors, other farmers and pig

workers. In addition, they all need to thoroughly wash their hands. Another effective measure is to remove all visible organic material, followed by disinfection. The disinfectant will not be effective if there is manure on the clothing or footwear.

Equipment and vehicles

Contaminated vehicles and drivers transporting pigs to the market or slaughterhouse or delivering feed represent a major risk factor for disease transmission. If not properly cleaned, they can transmit the faeces, saliva, urine etc. between the farms and/or slaughterhouses. The vehicles, especially those used to transport pigs, should be thoroughly cleaned and washed before returning or visiting other farms. All equipment entering the farm must be visibly clean and disinfected. If possible, the equipment should be farm-dedicated and not used at other farms.

Disinfection barrier for visitors and vehicles

A farm with more then 100 equids and ungulates must provide separate vehicle and pedestrian entrances. Vehicle and pedestrian entrances must be provided by disinfection barriers sizing 6.0 x 3.0 x 0.25 meter and 1.0 x 0.5 x 0.05 meter, respectively. The barriers must be filled with aqueous disinfectant solution. Disinfection barriers must be constructed in a way that allows appropriate cleaning and washing, as well as drainage of the solution via the drain hole (12).

Control of pests

Diverse animal species can act as vectors of disease transmission. There is a high potential of disease transmission over long distances by the birds (flue transmission via the wild ducks, etc.). Open system of pig breeding is associated with a risk of contact with birds at feeding and watering sites. Transmission of *Bordetella bronchiseptica, Campylobacter,* as well as zoonoses *Listeria monocytogenes, Chlamydia psittaci*, *Salmonella* and *Yersinia* by birds is well established. Flies and rodents can be possible transmitters at limited space areas (*Streptococcus suis, Salmonella, Bordetella, Rotavirus, Brachyspira hyodysenteriae, Leptospira, Encephalomyocarditis virus*).

Farmers should practice regular cleaning and disinfection of the farm, as well as pest and rodent control. Rodenticides must not be used where there are risks of pigs eating the bait or the rodent carcasses. Potential refuges for rodents, such as garbage, dumps, bush or wasteland, must be systematically eliminated. The premises should be surrounded by a pebble-zone. Pig feed rests should be regularly removed, and the feed should be properly stored to prevent access of rodents, wild animals and birds. If used, bedding should be protected from contamination by birds, rats or mice during storage.

Conclusion

The diseases that are present at the farm seriously limit the productivity and profitability of pig farming. Majority of applicable preventive measures include cleaning and disinfection procedures as well as careful control of health certificates that guarantee the disease-free status. However, the presence of the virus cannot be absolutely excluded. Prevention of possible transmission is difficult, particularly with respect of air currents and mobility of workers and farm visitors.

It is particularly important in extensive production systems. Massive vaccination policy is aimed at reducing population of susceptible animals to minimum; however, the susceptibility is not preventable, particularly in young weaners. Thus, the risk of still undiscovered infection still persists.

Implementation and improvement of biosecurity measures decreases the risk of introduction and spread of infectious agents, and thus should be the priority for each farmer. Each production system requires a specific program of biosecurity measures. Decision-makers should not allow compromising on public health, but technical and financial capacities of the individual farmer should be taken into consideration. In that respect, mutual understanding and cooperation between all sectors involved is essential.

Acknowledgements:

This work is partly supported by grant to the project TR31084 funded by the Ministry of education and science of Republic of Serbia.

Literatura

1. Blackwell T. (2003): Biosecurity-Where the Easy Money Is, OMAFRA.
2. Barceló´ J., Marco E. (1998): On farm biosecurity. In: Proceedings of the 15th IPVS Congress, Birmingham, England, 5–9 July, pp. 129–133.
3. Boklunda A., Albana L., Mortensen S.,Houec H. (2004): Biosecurity in 116 Danish fattening swineherds: descriptive results and factor analysis, Preventive Veterinary Medicine 66, 49–62
4. de Vos C.J., Saatkamp H. W., Huirne R. B.M., Dijkhuizen A.A. (2003): The risk of the introduction of CSFV at regional level in the European Union: a conceptual framework. Rev. sci. tech. Off.int. Epiz.. 22 (3), 795-810
5. Elbers A.R.W., Stegeman A., Moser H., Ekker H.M., Smak J.A. & Pluimers F.H. (1999): The classical swine fever epidemic 1997-1998 in the Netherlands: descriptive epidemiology. Prev Vet Med, 42, 157-184.
6. Elbers A. R. W. et al. (2001): Tracing systems used during the epidemic of classical swine fever in the Netherlands, 1997-1998, Rev. Sci. Tech. Off. Int. Epiz., 20 (2), 614-629
7. FAO animal production and health, good practices for biosecurity in the pig sector, the Food and Agricultural Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE) and the World Bank, Rome, 2010.
8. Julio Pinto C., Santiago U.V. (2003): Biosecurity practices on intensive pig production systems in Chile, Prev Vet Med 59,139-145
9. Kunavongkrit A. (2011): The Solution of the Healthy Pig for Healthy Life: Farm Management and Biosecurity. Proceedings of the 5th Asian Pig Veterinary Society Congress, 7-9 March , Pattaya, Thailand
10. Madec F. (2001): Biossecurity on Pig Units: A Major Missue for Herd Health Maintenance. In:Congresso Brasileiro veterinario especialistas em suinos, 10
11. Moennig V (2000): Introduction to classical swine fever: virus, disease and control policy.Veterinary microbiology. 73(2-3):93-102
12. MPŠV (2006): Pravilnik o veterinarsko-sanitarnim uslovima objekata za uzgoj i držanje kopitara, papkara, živine i kunića. Službeni glasnik RS, br. 81/2006.
13. Pravilnik o načinu neškodljivog uklanjanja životinjskih leševa i otpadaka životinjskog porekla i o uslovima koje moraju da ispunjavaju objekti i oprema za sabiranje,

neškodljivo uklanjanje i utvrđivanje uzroka uginuća i prevozna sredstva za transport životinjskih leševa i otpadaka životinjskog porekla. Službenom listu SFRJ, br. 53/89

14. Popović R., Marija Knežević, Biljana Štavljanin (2010): Razvoj tržišta osnovnih stočarskih proizvoda Tematski zbornik „Agroprivreda Srbije i evropske integracije – (ne)prilagođenost obostranoj primeni Prelaznog trgovinskog sporazuma“, Društvo agrarnih ekonomista Srbije i Privredna komora Vojvodine, Beograd, str. 103-104.
15. Republički zavod za statistiku Republike Srbije, (2009): ‘’Poljoprivreda 2008’’, Bilten 507, Beograd, ISSN 0582-6950
16. Roman A.V., Lukešova D., Novak P., Žižlavsky M. (2006): Biosecurity in pig breeding herds, Agricultura tropica it subtropica, 39,2, 119-122
17. Rushton J., Upton M. (2006): Investment in preventing and preparing for biological emergencies and disasters: social and economic costs of disasters versus costs of surveillance and response preparedness Rev. sci. tech. Off. int. Epiz., 2006, 25 (1), 375-388.
18. Stärk K.D.C., Horst H.S., Morris R.S. & Teuffert J. (1997): Elicitation of expert knowledge on risk factors for classical swine fever transmission in Switzerland. *Épidémiol. Santé anim.*, 31-32

MERE BIOSIGURNOSTI U SELU I NA SEOSKIM DOMAĆINSTVIMA

Radoslav Došen[1], Jasna Prodanov-Radulović[1], Ivan Pušić[1], Mladen Gagrčin[2]

1. Naučni institut za veterinarstvo "Novi Sad", Novi Sad, Srbija
2. Departman za veterinarsku medicinu, Poljoprivredni fakultet, Univerzitet Novi Sad, Srbija

Kratak sadržaj

Samo zdrave svinje mogu da obezbede profitabilnost i bezbednost hrane za potrošače svinjetine i proizvoda od svinjskog mesa. Pandemija 2009. H1N1 i početna neizvesnost o ulozi svinja u širenju virusa, uticalo je da Food and Agricultural Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE) and the World Bank, kao najvažniji prioritet odrede razvoj alata za poboljšanje mera biosigurnosti u proizvodnji svinja. Mere biosigurnosti imaju cilj da ograniče širenje bolesti svinja, smanje uticaj zaraznih bolesti na proizvodnju svinja i ekonomske gubitke koji su vezani za te bolesti. Zasnovane su na naučnim saznanjima o epidemiologiji i prenosu ključnih patogena svinja. Klasična kuga svinja (KKS) je oboljenje koje se nalazi na A listi Međunarodnog ureda za epizootije (OIE). KKS ima visok potencijal za ozbiljno i brzo širnje, bez obzira na državne granice, od izuzetnog je značaja u međunarodnom prometu životinja i životinjskih proizvoda i može da dovede do ozbiljnih socio-ekonomskih posledica (OIE, 2001). Infektivne bolesti ugrožavaju proizvodjače svinja, povećavaju rizik od gubitaka u proizvodnji, utiču na život ljudi na selu, mogu da utiču na širenje siromaštava naročito kad su u pitanju mali proizvodjači. Kontrola ovih bolesti zavisi od virulence uzročnika, broja životinja koje su izložene riziku, specifičnosti proizvodnje na odredjenoj regiji, ekonomske sange zemalje itd. Zemlje koje dostignu medjunarodne standarde u kontroli infektivnih bolesti, povećavaju svoju konkurentnost na medjunrodnom tržištu stoke, i proizvodna životinjsog porekla.

Ključne reči: biosigurnost, klasična kuga svinja, selo, seoska gazdinstva

Uvod

Zdravlje svinja je prvi korak ka dobroj proizvodnji, jer zdravlje bitno utiče, kako na obim proizvodnje, tako i na kvalitet proizvoda. Uvođenje zoonoza na farmu može dovesti do razvoja bolesti svinja, ali što je još važnije, može da ugrozi odličnu reputaciju svinjskog mesa na tržištu (1). Mere biosigurnosti imaju cilj da ograniče širenje bolesti svinja, smanje uticaj zaraznih bolesti na proizvodnju svinja i ekonomske gubitke koji su vezani za te bolesti. Zasnovane su na naučnim saznanjima o epidemiologiji i prenosu ključnih patogena svinja (7).

Biosigurnosne mere nisu važne samo u situaciji kad se epidemija pojavi, već bi trebalo da se rutinski primenjuju i kad su u pitanju najvažnije bolesti svinja. U tom smislu, ne samo različiti učesnici u industriji svinja već i svaki građanin bi trebao da poznaje mere biosigurosti i da bude dovoljno odgovoran u vezi sa njihovom ralizacijom (10).

Klasična kuga svinja (KKS) je oboljenje koje se nalazi na A listi Međunarodnog ureda za epizootije (OIE). KKS ima visok potencijal za ozbiljno i

brzo širnje, bez obzira na državne granice, od izuzetnog je značaja u međunarodnom prometu životinja i životinjskih proizvoda i može da dovede do ozbiljnih socio-ekonomskih posledica (OIE, 2001).

Biosigurnost je definisana kao primena zdravstvene kontrole i mera u cilju prevencije unošenja i širenja novih infektivnih agenasa u zapat (2). Mere biosigurnosti trebalo bi da omoguće da se izbegne unošenje patogena u farmu (spoljašnja biosigurnost) kao i da se spreči širenje uzročnika bolesti na neinficirana grla kada bolest već postoji na farmi (unutrašnja biosigurnost).

Prenos patogena i nastajanje bolesti

Najčešći način prenošenja je promet svinja u inkubaciji, ili perzistentno inficiranih svinja. Dalje, prenošenje je vezano za kontakt sa ljudima, transportnim vozilima, ishranu pomijama, kontakt sa divljim svinjama i drugim životinjama. Mogući putevi prenošenja su i vazduhom (aerosol), zatim mehaničko prenošenje putem artropoda (krpelj i drugi zglavkari), ptica, kućnih ljubimaca, glodara, putem djubriva, genetskim materijalom, tj. veštačkim osemenjavanjem. Značajna uloga u prenošenju KKS virusa, naročito tokom skorašnjih epidemija unutar EU, pripisuje se takozvanim infekcijama u susedstvu (5,18). To su farme u kojima je nepoznato poreklo infekcije i čija je lokacija u neposrednoj blizini drugog zapata, u kom je ranije ustanovljena infekcija. Infekcije u neposrednom okruženju nisu same po sebi putevi prenošenja, već se odnose na brojne moguće puteva prenošenja koji doprinose širenju virusa na malim udaljenostima uključujući i kontakt sa ljudima, protok i strujanje vazduha, glodare i ptice. Poznavanje svih faktora koji doprinose riziku unošenja virusa su osnovni preduslov za preduzimanje preventivnih mera koje su u isto vreme epidemiološki efikasne i ekonomski izvodljive (4).

Ako je infekt prisutan u fekalijama, pljuvački, sekretu nosa, krvi, mleku ili semenu može se mehanički preneti na druge životinje, kao i na objekte i opremu. Ovo uključuje kontaminiranu odeću, čizme, vozila, opremu, stelju i hranu za životinje. Period u kom oprema ostaje infektivna zavisi od vrste patogena i faktora sredine, kao što su temperatura, izloženost ultraljubičastom svetlošću, i efikasnosti dezinfekcionog postupka. Parvovirus (PPV), i Cirkovirus (PCV2) su veoma otporni i prežive nekoliko meseci u spoljašnjim uslovima. Virus reproduktivno respiratornog sindroma (PRRS), može u objektima da preživi nekoliko nedelja. Uzročnik dizenterije (*Brachyspira hyodysenteriae*) može da preživi u vlažnom fecesu i do 40dana (16).

Glavna funkcija mera biosigurnosti je da spreči ulazak uzročnika bolesti na gazdinstvo. Svi učesnici u proizvodnji moraju biti svesni da uzročnik veoma lako može da inficira svinje na gazdinstvu/farmi i da se zbog toga strogo pridržavaju biosigurnosnih protokola.

Uticaj strukture proizvodnje svinja i različitih proizvodnih sistema

Rizik od unošenja uzročnika bolesti, putevi širenja i koncepcija biosigurnosnih mera zavisi od strukture proizvodnje svinja u odredjenoj državi ili regiji, kao i od samih proizvodnih sistema na farmi.

Ekonomija, poljoprivreda, stočarstvo i ruralne oblasti u razvijenim zemljama su u poslednjih 20 god. prošle kroz veoma brze promene. Promene u poljoprivredi se ogledaju u promenama sistema u stočarskoj prizvodnji, kao što su

opadanje broja gazdinstava i farmi i porast broja grla u zapatu. Pored toga povećana je rentabilnost i proizvodnja po grlu, ali su porasla i ulaganja u infrastrukturu, tehnologiju i opremu, menadžment, genetiku i ishranu (17). Primera radi, prema Centralnom danskom poljoprivrednom registru (CHR), u martu 2003 god. bilo je 19362 farmi svinja. Od toga 9049 je registrovano kao za proizvodnju prasadi i 9300 za proizvodnju tovljenika za klanje.Preostalih 1013 moglo je biti da su proizvodni pogoni sa prasadima od 7 do 30kg koji bi mogli biti novo registovani pogoni (još nisu napunjeni) ili lokacije na kojima trenutno nema svinja (3). Razvijene zemlje su u poslednjih 20 godina uspele staviti pod kontrolu mnoge bolesti svinja kao i odredjene zarazne bolesti koje imaju i širi značaj. To je dovelo do smanjenja troškova vezanih za zdravlje životinja i povećanje efikasnosti u stočarskoj proizvodnji ovih zemalja. Regioni sa nepoznatim ili neizvesnim zdravstvenim statusom generalno imaju slabu upravnu i veterinarsku operativu, a stočarstvo je većim delom u ekstenzivnim sistemima i na pašnjacima. Takvi regioni su izolovani, imaju slabe trgovačke veze i nalaze se u zoni siromašnih zemalja u razvoju (17).

U Srbiji se svinjarska proizvodnja odvija uglavnom na malim porodičnim poljoprovrednim gazdinstvima. Tokom zadnje dve decenije nastaju komercijlana porodična poljoprovredna gazdinstva koji su uvećali resurse i kapacitete znatno iznad proseka malih porodičnih gazdinstva. Preostali deo stočarske proizvodnje odvija se na ne-porodičnim poljoprivrednim gazdinstvima, koja su najvećim delom u vlasništvu kompanija koje su ih kupile u procesu privatizacije tokom prethodnih godina tranzicije.

Broj svinja u Srbiji je 2007.2008. i 2009 iznosi, prema podacima RZS 3.8 , 3.6 i 3.5 miliona grla (15). Podaci iz Popisa 2002. godine ukazuju da se proizvodnja svinja obavlja uglavnom na malim porodičnim poljoprivrednim gazdinstvima. Ukupan broj poljoprivrednih gazdinstava koja se bave proizvodnjom svinja je nešto veći od 400.000. Prosečan broj svinja svih kategorija po poljoprivrednom gazdinstvu 2008. godini je bio 9 grla (14). Na tako velikom broju domaćinstava sa malim brojem svinja, veoma je teško ostvariti permanentnu i kvalitetnu zdravstvenu kontrolu.

Od 111951 gazdinstva 810 (073%) je kategorisano kao komercijlane farme, 255 (0.23%) kao porodične farme tipa A, 37555 (33.55%) kao porodične farme tipa B, 73252 (62.43%) kao dvorišta, a 79 (0.07) vlasnika je držalo svinje na otovrenom (usmeno saopštenje Ostojić, 2012).

Struktura proizvodnje svinja u našoj zemlji pokazuje velike varijacije između pojedinih regiona. U pojedinim regionima nalaze se veliki proizvođači prasadi (Požarevac, Jagodina, Kruševac), dok u drugoj regiji farmeri se bave tovom (Srem). Uslovi proizvodnje su najčešće i kod jednih i kod drugih relativno loši. Postoje i regije sa velikom gustinom farmi većih proizvodnih kapciteta sa zadovoljavajućim uslovima za proizvodnju (Bačka).

Paralelno tome, promet svinja je znatno intenziviran i doprinosi širenju zaraze iz jedne regije u drugu. U 2002. godini KKS je transportom preneta iz područja Jagodine i Lozovika u Bačku, kao i iz Golubinaca u Kuzmin. Zbog toga, veoma je važno da se dobiju brze, pouzdane i potpune informacije vezane za puteve trgovine (prometa) i kontaktne farme. Uslužni tov je sa epizootiološkog aspekta posebno problematičan, jer se prasad za tov kupuju na različitim regijama i od različitih sitnih proizvođača, često i na stočnim pijacama, pa preti objektivna

opasnost da se unese kako KKS tako i druge bolesti. Najbolji primer je prenošenje KKS, transportom zaraženih prasadi, sa područja Jagodine u Čurug, septembra 2002 godine, gde je toku suzbijanja i eradiakcije uništeno preko 1000 prasadi iz uslužnog tova.

Držanje svinja u šumi

U pojedinim regionima, naročito uz velike reke, kod nas se drže na ispaši domaće svinje, te krug infekcije lako može biti zatvoren. U šumi, kraj reke Save našli smo 7 zapata domaćih svinja, ukupno oko 1000 svinja različite starosti i različitih vlasnika. Svinje se slobodno kreću po šumi, tako da je moguć neposredan kontakt između domaćih i divljih svinja. Na jesen se svinje vraćaju u selo. Uloga divljih svinja kao rezervoara virusa i mogućeg izvora infekcije za domaće svinje postaje sve jasnija pošto je u poslednjih nekoliko godina saopšteno postojanje epizootiološke veze između KKS virusne infekcije kod divljih i domaćih svinja. Epidemiološka i filogenetska istraživanja su pokazala da KKS virus cirkuliše i održava se godinama u pojedinim populacijama divljih svinja. Unošenje KKS virusa u prijemčivu populaciju divljih svinja obično se odigrava putem kontaminirane hrane, na primer, smeće (iznutrice, utrobe) koje je bačeno na groblja i deponije (11). S druge strane, viremične divlje svinje, koje su još uvek u dobrom zdravstvenom stanju mogu da se presele iz područja gde su zaražene i da unesu virus u susedne geografske regije.

Skupljanje otpadaka za ishranu svinja

Sakupljanjem otpadaka za ishranu svinja nosi najveće rizike za pojavu KKS i drugih zaraznih bolesti (pabirčenje otpadaka klipova kukuruza i drugih plodova na njivama, otpaci iz kontejnera ili smetlišta itd.). Pri takvom načinu ishrane svinja nije moguće kontrolisti kontakt sa drugim svinjama (domaćim i divljim), drugim divljim životinjama, glodarima i pticama pa se stvaraju povoljni uslovi za širenje bolesti. Zahvaljući prirodi ovakve proizvodnje, upravo taj sistem je najproblematičniji. S jedne strane, seljaci lutaju i sakupljaju otpatke, a sa druge strane, drže svinje puštene da se slobodno kreću (oko kuće, po livadi ili šumi), što bitno utiče na to da ne možemo uvesti efikasne biosigurnosne mere. Medjutim, i u takvim slučajevima se mogu primeniti jednostavne mere uz minimalne troškove (7).

Ishrana pomijama

Ishrana pomijama je zabranjena nacionalnim propisima. Ipak, u zemlja-ma u razvoju, koriste se zbog visoke energije i sadržaja proteina otpaci iz restorana i kuhinja za ishranu svinja, jer to omogućuje brz tov. Ako se pomije koriste za ishranu svinja moraju se termički obraditi (kuvati) i to tako da minimalana temperatura prilikom kuvanja iznosi 100 °C u trajanju 1 sata.

Uvođenje zdravih svinja u selo

Selo treba posmatrati kao jedinsvtenu epidemiološku jedinicu, jer se svinje u okviru sela radjaju i odgajaju, razmenjuju i mešaju, pa treba prepostaviti da su istog zdravstvenog statusa. Kad se nove svinje uvode u selo trebalo bi da su zdrave, a posebna pažnja treba da se obrati kad svinje potiču sa pijace. Kupljene svinje moraju posedovati zdravstvenu dokumentaciju kojom se tvrdi da su zdrave i da ne potiču sa teritorije na kojoj je ustanovljena zarazna bolest. Dalje, trebalo bi ih staviti u izolaciju (karantin) u trajanju od 30 dana. Tokom karantina, svinje treba redovno

pregledati kako bi se otkrili klinički znaci bolesti. Karantin treba da se obavi u posebnom objektu, koji je lociran na periferiji, kako bi se izbegla kontaminacija svinja u selu. Takođe se u karantinu mora obezbediti posebna odeća i obuća kao i redovno čišćenje, pranje i dezinfekcija. Pored toga, veliki problem predstavlja kretanje krmača i nerastova zbog parenja. Važno je biti upoznat sa zdravstvenim stanjem priplodnjaka. Neki poljoprivrednici drže nerasta za pripust, te je od suštinskog značaja da se nerast ne pripušta u više sela.

Trgovina bolesnim svinjama

Nije neuobičajeno da farmer kad ustanovi prve znake bolesti pokuša da što pre svinje proda na klanje. Trgovina bolesnim svinjama je ozbiljan rizik, naročito ako se iznesu na pijacu, jer tad šire uzročnike bolesti na druge svinje. Pored toga mogu se javiti veliki zdravstveni problemi, jer svinje prenose i zoonoze te mogu oboleti ljudi, a posebno je opasno za decu, trudnice i starije osobe. Uprkos finansijskom gubitku koje mogu imati siromašni poljoprivrednici, prodaja ili potrošnja mesa bolesnih svinja mora biti zabranjena. Potencijalni kupci moraju biti informisani da su jeftine svinje koje se prodaju najverovatnije bolesne(7).

Odlaganje mrtvih svinja

Pravilnikom o načinu neškodljivog uklanjanja životinjskih leševa i otpadaka životinjskog porekla i o uslovima koje moraju da ispunjavaju objekti i oprema za sabiranje, neškodljivo uklanjanje i utvrđivanje uzroka uginuća i prevozna sredstva za transport životinjskih leševa i otpadaka životinjskog porekla (13) je propisano da držalac prijavljuje uginuće životinja i otpatke životinjskog porekla nadležnom državnom organu radi njihovog neškodljivog uklanjanja. Dalje je regulisno da držalac životinje ne sme da odere, otvori ili raseče životinjski leš. Nadležni državni organ treba da obezbedi službu za prijem prijava o uginuću životinja; transport životinjskih leševa sa mesta uginuća do objekta za sakupljanje ili objekta za obdukciju ili objekta za neškodljivo uklanjanje leševa i otpadaka životinjskog porekla, kao i dezinfekciju prostorija, odnosno mesta na kome se leš nalazio. Medjutim u praksi ovo ne funkcioniše, te su farmeri suočeni sa velikim problemima oko ulklanjanja leševa. Problemi neuredjenog stocnog groblja su zna, jer vlasnik pre nego što se dijagnostikuje KKS leševe uginulih životinja baca pored jame grobnice, koja najcešce nije ogradjena. Mogli smo da vidimo i da se leševi bacaju u kanale, pa i neposredno pored puta. Kod farmi veceg kapaciteta ovaj problem je narocito izražen, jer se tu radi o vecem broju uginulih životinja, a leševi se bacaju u „jame grobnice" koje nisu ogradene, niti su do-voljno duboke. Leševi su dostupni divljim životinjama, pacovima, psima i mackama lutalicama koji mogu da budu mehanicki vektori. Vlasti bi trebalo da spreče ilegalnu trgovinu uginulim životinjama, jer bi to moglo imati ozbiljan uticaj na zdravlje potrošača i poverenje u kvalitet prerađevina od svinjskog mesa (7).

Čišćenje i dezinfekcija

Nije moguće preduzeti mere prevencije ako se svinje drže slobodno i ako lutaju bez kontrole njihovog vlasnika. Ali i tad su svinje obično noću smeštene u sklonište. Skloništa trebaju da budu očišćena i dezinfikovana. To se odnosi na bilo koju opremu i alat koji se koristi prilikom obavljanja posla oko svinja, a pogotovo ako se dele sa drugim čuvarima.

Prvovremena nadokanda štete i pravilno inforimisanje

Vreme u kom vlasnik prijavi pojavu bolesti na svom imanju je od ključnog značaja za sprečavanje širenja KKS. Kako bi vlasnik odmah prijavio bolest neophodno je obezbediti brzu, efikasnu i pravičnu nadoknadu štete koja je posledica bolesti na imanju. Zbog toga što strahuju da će protiv njih biti pokrenut zakonski postupak, ili strahuju od osoba koje su od njih nabavile inficirane svinje, ili zbog toga što neveruju državnim službama, farmeri ponekad oklevaju da obaveste veterinare i nerado daju informacije o komšijama. Stoga je od vitalnog interesa obezbediti poverenje i saradnju sa farmerima koji se bave proizvodnjom svinja (6).

Lokacija i ograđivanje gazdinstva/farme

Lokacija farme je veoma važan faktor kad je u pitanju unošenje uzročni-ka bolesti. Kad se gradi nova farma, pa čak i malog kapaciteta, mora se uzeti u obzir udaljenost od drugih farmi i glavnih puteva. Neophodno je minimalno rastojanje između susednih farmi kako bi se sprečilo širenje bolesti aerosolom. Najvažniji faktori koji određuju rizik unošenja novih bolesti su geografski položaj farme i blizina drugih živih svinja. Takodje su značajni broj, vrsta i gustina farmi svinja u radijusu od 2 km.

U idelanom slučaju, nova farma bi trebala da bude izgradjena na lokaciji sa malom gustinom svinja, zatim da budu daleko od drugih faktora rizika kao što su žive svinje, klanice, lagune, i puteva koje koriste prevoznici otpada i prevoznici svinja. Minimalno rastojanje izmedju dve farme treba da iznosi najmanje 500 m (16).

Gazdinstvo/farma mora biti potpuno ogradjena, a ograda mora biti tako izgradjena da može da spreči ulazak divljih životinja uključujući divlje nerastove i divlju prasad. Kontakt sa pticam takođe mora biti onemogućen postavljanjem mreža na prozore i druge otvore. Ulaz na farmu mora biti jasno označen i pod kontrolom.

Posetioci gazdinstva

Posetioce farme treba pitati da li su skoro bili na mestima koja mogu biti kontaminirana, kao što su farme svinja, klanice, pijace, na mestima gde se radilo sa svinjama ili leševima uginulih svinja. Ako jesu, ne mogu biti primljeni, osim ako se ne primene posebne i stroge mere biosigurnosti. Često je praksa je da farmeri ne presvlače odeću i obuću posle rada sa svinjama. Za posetioce, druge poljoprivrednike i radnike na farmi treba obezbediti odeću i obuću koja se koristi samo na farmi. Pored toga treba da operu ruke. Još jedna efikasna opcija je da se posle čišćenja i uklanjaja vidljive organseke materije izvrši dezinfekcija. Dezinfekcija nema smisla ako se na odeći ili obući nalazi djubre, jer neće biti efikasna.

Vozila i oprema

Vozači i vozila kojim se prevoze svinje na pijace, klanice ili se isporučuje hrana predstavljaju velik rizik, jer ako nisu dovoljno dobro očišćeni oni će na veća rastojanja obaviti prenos izmeta, pljuvačke, urina itd. sa jedne farme ili klanice na drugu farmu. Vozila, posebno ona koja se koriste za transport svinja, treba dobro očistiti pre povratka na farmu ili posete druge farme. Sva oprema koja se unosi u farmu i koja će verovatno doći u kontakt sa svinjama moraju biti čisti i dezinfikovani. Ne treba da se koriste na drugim gazdinstvima

Dezo-barijera za vozila i radnike

Farma sa više od 100 uslovnih grla kopitara i papkara mora da ima odvojen kolski i pešački ulaz. Na kolskom i pešačkom ulazu moraju biti izgrađene dezinfekcione barijere dimenzija 6,0 x 3,0 x 0,25 metara i 1,0 x 0,5 x 0,05 metara i ispunjene vodenim rastvorom dezificijensa. Dezinfekcione barijere moraju biti izgrađene na način koji omogućava njihovo čišćenje i pranje, kao i ispuštanje rastvora kroz drenažni otvor (12).

Kontrola štetočina

Mnoge životinje mogu biti prenosioci uzročnika bolesti. Ptice imaju najveći potencijal kad je upitanju prenošenje bolesti na veća rastojanja (divlja patka prenosi grip, itd.). Ako se svinje drže na otvorenom onda na mestima gde se hrane i poje dolaze u dodir sa pticama koje mogu da lete sa farme na farmu. Dokazano je da ptice mogu preneti: *Bordetella bronchiseptica, Campylobacter,* kao i zoonoze *Listeria monocytogenes, Chlamydia psittaci, Salmonella* and *Yersinia.* Na kraće razdljine uzročnike bolesti mogu preneti muve i glodari (*Streptococcus suis, Salmonella, Bordetella, Rotavirus, Brachyspira hyodysenteriae, Leptospira, Encephalomyocarditis virus*)

Farmeri treba uvek da drže objekte čiste i redovno da sprovode deratizaciju i dezinsekciju. Rodenticidi ne mogu da se koriste tamo gde postoji rizik da svinje mogu da konzumiraju mamke ili leševe glodara. Potencijalna skrovišta glodara kao što su smeće, deponije, grmovi, zapuštene površine moraju biti sistematski eliminisane. Oko objekata bi trebalo napraviti pojas od šljunka. Ostaci hrane za svinje treba da se redovno uklanjaju i da se hrana pravilno uskladišti, tako da se spreči pristup glodarima, divljm životinjama i pticama. Ako se koristi stelja, mora se sprečiti njena kontminacija pticama, pacovima, miševima tokom skladištenja.

Zaključak

Bolesti koje su prisutne na farmi značajno doprinose ograničavanju produktivnosti i profitabilnosti u industrijskoj proizvodnji svinja. Najveći broj preventivnih mera koji se može preduzeti sastoji se od procedura čišćenja i dezinfekcije i ispitivanja zdravstvenih sertifikata koji garantuju slobodu od bolesti. Međutim prisustvo virusa se nikad ne može u potpunosti odbaciti. Preveniranje svih mogućih puteva prenošenja je teško naročito kad se ima u vidu mobilnost čoveka i strujanje vazduha. Ovo je naročito važno za svinje koje se drže ekstenzivno. Politika masovne vakcinacije ima za cilj umanjenje populacije prijemčivih životinja na minimum, ali ne može u potpunosti prevenirati prijemčivost životinja naročito mlade prasadi i stoga postoji rizik od neustanovljenih infekcija. Jačanje mera biosigurnosti samnjuje rizik od unošenja uzročnika bolesti i njihovog širenja i zbog toga predstavlja prioritet u aktivnostima koje preduzima farmer.

Svaki proizvodni sistem zahteva poseban program biosigurnosti, a oni koji donose odluke ne bi trebalo da prave kompromis, kad je javno zdravlje u pitanju, ali isto tako treba da imaju u vidu tehničke i finansijske kapacitete farmera koji treba da ih sprovedu. Neophodno je obezbediti zajedničko razumevanje i dobru saradnju u interesu društa u celini.

Zahvalnica: U radu je predstavljen deo istraživanja po projektu TR31084 koji finansira Ministarstvo prosvete i nauke Republike Srbije.