

## Surveillance and control of classical swine fever in Bulgaria, a country with a high proportion of non-professional pig holdings

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### Abstract

Control and eradication of classical swine fever (CSF) in countries with a high proportion of non-professional pig holdings poses additional challenges for the veterinary services since such holdings may act as a reservoir for CSF virus and as possible source of infection for commercial farms. Bulgaria has about 60 000 non-professional holdings in which 34% of the domestic pig population are kept.

Bulgaria started in 2007 a new strategy for surveillance and control of CSF, based on the categorization of pig holdings according to their biosecurity standard. Basically three categories of holdings were identified: (i) holdings with high or appropriate biosecurity measures comprising large industrial farms or smaller family farms involved in trade, (ii) holdings with low or no biosecurity measures comprising smaller family farms involved in local trade and back yard farms and (iii) traditional outdoor pig herds (East Balkan Pigs).

Once the holdings were categorized, adequate CSF surveillance programmes manageable by the local and central veterinary service, could be designed for the different types of holdings. Additional tools including the electronic identification system for holdings and pigs and a check-list for clinical examinations were introduced to facilitate the surveillance activities.

In this communication the categorization of farms is presented as a successful tool for CSF surveillance and control in different categories of pig holdings. Under conditions like in Bulgaria categorization of farms appeared to be also a reliable method for improving the biosecurity level and an essential tool for CSF surveillance and control in non-professional pig holdings.

**Keywords:** Classical swine fever, non-professional holdings, surveillance.

### Introduction

Classical swine fever (CSF), also known as *Hog Cholera*, is a fatal viral disease affecting pigs and wild boar. CSF is notifiable to the World Organisation for Animal Health (OIE) and causes major economic losses especially in countries with an industrialised pig production system [1]. When outbreaks of the disease occur in domestic pigs, a broad set of eradication measures have to be applied in the Member States of the EU according to the Council Directive 2001/89/EC on Community measures for the control of classical swine fever [2]. Eradication programmes in recent decades have been successful to a great extent in many European countries including Bulgaria.

However, countries like Bulgaria with a high proportion of non-professional pig holdings, also addressed as back yard holdings, face additional difficulties in surveying and controlling the disease. In Bulgaria about 250,000 pigs (34%) are kept in about 60,000 non-professional holdings while 450,000 pigs (64%) are kept in 61 industrialized farms. The role of non-professional pig holdings in the CSF problematic is of great epidemiological significance since such holdings may act as a reservoir for CSF virus and as possible source of infection for commercial farms. Despite their average small size and pig density and therefore their apparent unimportance, non-professional holdings can play an important role in the dynamics of a CSF epizootic. For instance, Bulgaria experienced during recent years six CSF outbreaks in 2006, one in 2007 and the last one in 2008, all of them in non-professional holdings with low biosecurity measures. Additionally two outbreaks were detected in free ranged pig herds in the Eastern part of the country in 2007.

Rearing pigs in non-professional holdings is very common and has tradition in the rural areas in most of the new and acceding Member States. In these countries, this type of rearing still is a significant part of the agricultural practices. It represents an important source of meat supply for the population in the countryside and often generates a valuable cash income. Apart from that, non-professional pig holdings play an integral role in recycling of food and kitchen waste as pigs on these holdings are fed amongst others with leftovers from the kitchen.

Usually, non-professional holdings have a low standard of biosecurity and are much more difficult to control by the veterinary services. In particular surveillance activities, as for example for CSF, are demanding and challenging.

We present a feasible approach how CSF surveillance in domestic pigs can be performed in a country with a high proportion of non-professional pig holdings.

### Materials and methods

Three main steps were conducted towards facilitating a pragmatic surveillance programme for CSF in the domestic pig population.

1) Categorization of all domestic pig holdings on the basis of biosecurity measures in place. The following basic criteria of biosecurity were used for categorizing the holdings:

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- production cycle (closed or open),
- keeping system (indoor/partially outdoor; access to foreign personnel; access to other pigs or feral pigs),
- appropriate means of disinfection at the entrance and exit of buildings,
- fences around the holdings,
- appropriate hygienic measures for persons coming in contact with pigs,
- trade patterns (free markets or direct contact of the owner with potential customers),
- use of swill feeding,
- outdoor keeping, including traditional free ranging systems,
- number and categories of pigs,
- regular veterinary controls.

2) Introduction of an electronic information system for registration of animal holdings and identification of pigs. The basic elements of the information system are:

- registration of all pig holdings by categories;
- registration of all owners;
- registration and identification of all pigs;
- registration of all movements of pigs and traceability;
- registration of sampling and laboratory testing;
- registration of all clinical examinations;
- registration of the health status of pig herd and individual pigs;
- operation and access to the electronic information system by official and private vets concerned.

3) Introduction of a standardized check-list for clinical examination of pigs in the framework of active surveillance for CSF.

Based on the above three components an appropriate CSF surveillance scheme for the different types of holdings was implemented.

In holdings with high biosecurity the survey is conducted as follows:

- in large industrial farms monthly clinical examinations by private vets (12/year) and clinical examinations by official vets every two months (6/year); serological investigations to detect 20% antibody prevalence with 95% confidence;
- in small commercial farms with high biosecurity monthly clinical examinations by private and official vets (24/year) and serological investigations to detect 10% antibody prevalence with 95% confidence.

In holdings with low biosecurity the survey is conducted as follows:

- in commercial farms with low biosecurity clinical examinations by private vets every two months (6/year) and clinical examinations by official vets every three months (4/year); serological investigations to detect 10% antibody prevalence with 95% confidence;
- in backyard holdings with poor biosecurity where pigs are kept for own consumption only clinical examinations by private vets every three months

(4/year) and clinical examinations by official vets on 10% of the backyards every three months (4/year). Samples for laboratory testing are taken only in case of suspicion.

Holdings with free ranging pigs (East Balkan pigs) are surveyed as follows:

- monthly clinical examination of all herds by private vets (12/year);
- clinical examination every 3 months by official veterinarians (4/year);
- clinical examination at any occasion when pig identification is performed or when animals are moved;
- serological investigations to detect 10% antibody prevalence with 95% confidence;
- serological investigations of all animals 7 days prior to movement to slaughter or to other holding.

### Result

The following 5 types of domestic pig holdings were identified:

1. **Industrial farms:** large farms with a high biosecurity level (61 farms with 444,341 pigs);
2. **Family farms type A:** smaller farms with a high biosecurity level (89 farms with 24,640 pigs);
3. **Family farms type B:** smaller farms with a low biosecurity level (1,728 farms with 41,279 pigs);
4. **Backyard farms:** holdings with a low biosecurity level, up to 5 pigs, no mother sows, kept for own consumption, not entering into the national trade cycle (58,673 holdings with 106,928 pigs);
5. **Traditional outdoor holdings of East Balkan pigs:** particular Bulgarian pig breed, kept outdoor in the Eastern parts of the country. All herds are under a strict supervision of the veterinary service (98 herds with 10,104 pigs).

The following results were obtained during the implementation of the CSF programme in 2009:

CATEGORIES	№ farms	№ pigs	№ tests serology	№ tests virology	№ clinical examinations
<b>Industrial</b>	61	444341	11959	167	5775
<b>Type A</b>	89	24640	3222	37	2145
<b>Type B</b>	1728	41297	17596	202	13118
<b>Backyards</b>	58673	106928	649	5	74244
<b>East-Balkan pigs</b>	98	10104	4570	4	878

### Discussion

From a legal point of view all pig holdings, notwithstanding if they are professional or non-professional, are equal and have to fulfil the same requirements related to control and eradication of CSF. As such, all measures laid down in Council Directive 2001/89/EC concerning the control of classical swine fever [2] and in Commission Decision 2002/106/EC on the diagnostic manual for CSF [3] should be enforced by the veterinary authorities in case of a suspicion or an outbreak, regardless of the number and type of pigs reared in the holding. However, uniform and standardized disease control requirements are difficult to be followed in countries with a heterogeneous



omestic pig sector, as for example in Bulgaria, which is characterized by different farming types, biosecurity levels, trade patterns or social and traditional backgrounds. In particular non-professional pig holdings are often not fully under the control of the authorities and foreseen measures are therefore not as effective as desired. Surveillance and control measures are difficult to implement and the veterinary authorities may be faced with major problems in managing CSF outbreaks. It will supposedly take a lot of effort controlling and eradicating the disease within a reasonable time period, especially if a considerable amount of virus is circulating.

Since the level of biosecurity of a pig holding influences the risk of virus perpetuation directly and may play a key role in facilitating a CSF epidemic, we decided, as a first step, to categorize all pig holdings in Bulgaria based on biosecurity grounds. Basically three categories were identified: (i) holdings with high or appropriate biosecurity measures comprising large industrial farms or smaller family farms involved in trade, (ii) holdings with low or no biosecurity measures comprising smaller family farms involved in trade and back yard farms keeping pigs for own consumption only and (iii) traditional outdoor pig herds (East Balkan Pigs) which are under a permanent control of the veterinary service but under particular risk due to their potential contact with wild boar.

From a CSF risk point of view we considered the family farms with low biosecurity level (family farms type B) the most dangerous one, since pigs, pigmeat and meat products from such farms may enter the national market and may contribute to the spread of CSF virus. This is proven by most of the CSF outbreaks in domestic pigs during the past years which occurred in family farms type B. In contrast, back yard holdings which keep pigs only for family consumption do not pose such a high risk in promoting epidemics, but may play a role as a hidden virus reservoir.

Once the holdings were categorized, adequate CSF surveillance programmes manageable by the local and central veterinary service, could be designed for the different types of holdings. Additional tools including the electronic identification system for holdings and pigs and a check-list for clinical examinations were introduced to facilitate the surveillance activities.

The surveillance results from 2009 mirror the activities of the veterinary service in relation to CSF. They show

also where emphasis has to be put to amend the activities in the following years. Laboratory examinations, in particular virological testing should be increased in combination with clinical examinations, where suspect animals are found.

Since family farms type B have been identified to carry the highest CSF risk, it is aimed to continuously reduce the number of these holdings as much as possible, either by upgrading the biosecurity level (become family farms type A) or by excluding them from local trade (converting them into backyard farms). As a result of the new strategy the number of type B farms could be reduced from 4981 to 1728 during the last 3 years.

We can conclude that the systematic approach of categorizing pig holdings based on their biosecurity level is an effective tool to plan and conduct surveillance programmes for CSF in domestic pigs.

By the new categorization of holdings, the check lists for active surveillance and the outcome of the implementation of the programme, Bulgaria could present to the European Commission and to the other Member States a strong and reliable CSF control and surveillance strategy.

#### References

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