



## Biosecurity practices in Spanish pig herds: Perceptions of farmers and veterinarians of the most important biosecurity measures

M. Simon-Grifé<sup>a,\*</sup>, G.E. Martín-Valls<sup>a</sup>, M.J. Vilar<sup>d</sup>, I. García-Bocanegra<sup>b</sup>, M. Martín<sup>a,c</sup>, E. Mateu<sup>a,c</sup>, J. Casal<sup>a,c</sup>

<sup>a</sup> Centre de Recerca en Sanitat Animal (CRESA), UAB-IRTA, Campus de la Universitat Autònoma de Barcelona, 08193 Bellaterra, Barcelona, Spain

<sup>b</sup> Departamento de Sanidad Animal, Universidad de Córdoba, 14071 Córdoba, Spain

<sup>c</sup> Departament de Sanitat i Anatomia animals, Universitat Autònoma de Barcelona (UAB), 08193 Bellaterra, Barcelona, Spain

<sup>d</sup> Department of Food Hygiene and Environmental Health, Faculty of Veterinary Medicine, University of Helsinki

### ARTICLE INFO

#### Article history:

Received 8 November 2011

Received in revised form

28 November 2012

Accepted 30 November 2012

#### Keywords:

Biosecurity measures

Perceptions

Pigs

### ABSTRACT

One hundred Spanish pig farms were surveyed to determine the biosecurity measures currently applied, as reported by farmers, and to investigate the importance awarded by farmers and veterinarians to each of these measures. Data was gathered by means of a questionnaire administered to farmers and veterinarians. Biosecurity measures were reported based on two scenarios: in the presence and in the absence of a highly contagious disease. Multiple-correspondence and two-step cluster analyses were performed to investigate the effect of farm type on the biosecurity level. Farmers awarded significantly higher scores to their farms' level of biosecurity than the veterinarians servicing said farms. According to the farmers and veterinarians, the most important biosecurity measures were those aimed at minimising the risk of disease introduction by visits and vehicles. Biosecurity practices seeking to reduce the risk of disease introduction by breeding stock were not applied on a considerable number of farms. The findings also revealed that medium-sized to large farms located in high pig density regions reported higher biosecurity measures than small herds located in low pig density areas.

© 2012 Elsevier B.V. All rights reserved.

### 1. Introduction

Spain produces 40 million pigs per year (Anonymous, 2010); it is the second largest pork producer in the European Union (EU) accounting for 15% of pork production and is also the third largest pork exporter in the world (FAOSTAT, 2009). The economic importance of the pig industry and the considerable pig movement within Spain call for the implementation of appropriate biosecurity measures to prevent the introduction and spread of disease.

The adequate application of biosecurity measures largely depends on farmers' attitude towards and comprehension of contagious diseases and their prevention. Some

studies carried out in Great Britain among cattle and sheep farmers have shown that farmers frequently have a negative attitude towards biosecurity and are unaware of the effectiveness and economic benefits of adopting biosecurity measures (Gunn et al., 2008). Several reasons can be attributed to farmers' lack of confidence in biosecurity: lack of knowledge, the economic cost of implementing these measures, the additional work implied and the dislike of mandatory rules (Gunn et al., 2008; Fraser et al., 2010; Kristensen and Jakobsen, 2011). Veterinarians play a key role in training and educating farmers and, for most of them, they represent the main source of information (Gunn et al., 2008).

In recent years, the importance of implementing a biosecurity programme has been recognised, and several studies have investigated the biosecurity measures put in place on pig farms (Hurnik et al., 1994; Pinto and Urcelay,

\* Corresponding author. Tel.: +34 93 581 45 27; fax: +34 93 581 44 90.  
E-mail address: [meritxell.simon.grife@gmail.com](mailto:meritxell.simon.grife@gmail.com) (M. Simon-Grifé).

2003; Boklund et al., 2003/2004, 2004; Casal et al., 2007; Ribbens et al., 2008; Costard et al., 2009; Nöremark et al., 2010). Of late, some studies carried out in Belgium showed that farm type and size bear an influence on the degree of biosecurity applied (Ribbens et al., 2008). The perceptions and attitudes of farmers and veterinarians towards biosecurity have also been explored (Casal et al., 2007; Gunn et al., 2008; Fraser et al., 2010; Kristensen and Jakobsen, 2011).

In Spain, a non-random study was conducted to assess biosecurity practices and farmers' perceptions of these practices (Casal et al., 2007). Only a few studies have explored veterinarians' perception of this issue (Gunn et al., 2008). No studies have been found which examine the effect of farm type on the level of biosecurity.

The objectives of this study were to assess the biosecurity practices currently reported on Spanish pig farms, as well as to describe the attitudes of Spanish veterinarians and pig farmers towards biosecurity. Furthermore, the effect of the farm type on the application of biosecurity measures was also examined.

## 2. Materials and methods

### 2.1. Study design

A cross-sectional survey was conducted between 2008 and 2009 in Spain. Regions with less than 2.5% of the national pig population were excluded from the study. The sampling was stratified by region according to the number of farms in each one. The initial hypothesis for the proportion of biosecurity measures reported corresponded to 50%, desired precision was set at  $\pm 10\%$  and the confidence level at 95%, resulting in 97 farms to be sampled. For practical reasons, the number of farms was rounded up to 100.

Sampling was planned to be conducted on farms with more than 80 sows disregarding lower size farms. Despite this criterion, we have included a farm with only 33 sows. The declared census for this farm was higher than 80 sows but when we visited the farm the real number of sows had reduced. Spanish geography is divided into 17 regions known as Autonomous Communities. In the regions in which the autonomous government directly collaborated with the sampling (Andalusia, Castile-La Mancha, Catalonia, Extremadura, Galicia and Navarre), the farms (71) were selected randomly (applying random numbers to the farms' registered reference number provided by health authorities). In the other four regions (Aragon, Castile and León, Murcia and Valencia), which comprised 29 farms, full random sampling did not prove possible; therefore, convenience sampling, based on the availability of pig farmers, was used to complete the selection of farms. All the farmers contacted for this study agreed to participate therein.

### 2.2. Questionnaire design

A questionnaire was administered to the pig farmers by way of personal interviews. Veterinarians were also interviewed when present on the farms studied. Sixty-one veterinarians were invited to answer the questionnaire, all of whom agreed to take part in the study. The complete

questionnaire is available in Spanish upon request from the corresponding author.

The questionnaire contains questions, which can be grouped into four parts:

1. *General data on the farm*: Identification, location, herd size, presence of other domestic animal species.
2. *Biosecurity measures related to replacement stock*: Number of origins of replacement gilts, quarantine period for gilts, location of replacement stock (distance from the farm) and other related variables.
3. *Biosecurity measures related to farm management and facilities*: This part included information on facilities and management practices to prevent the introduction of new diseases and reduce their spread on the farm.
4. *Opinion of biosecurity measures*: This part was subdivided into three blocks (a) a list of the most important biosecurity measures, according to farmers and veterinarians, to prevent the introduction and spread of diseases (up to a maximum of five measures); (b) a list of the most important biosecurity measures, according to farmers and veterinarians, in the event of an outbreak of a highly contagious disease on neighbouring farms (up to a maximum of five measures); and (c) a biosecurity rating (on a scale of 0 [no application of biosecurity measures] to 10 [effective execution of all measures]) of their own farms awarded by farmers, and by veterinarians concerning the farms they service.

To minimise confusion and maximise accuracy, the questionnaire was simple and clear (Dohoo et al., 2004). All the questions were closed, with the exception of the opinion questions regarding biosecurity. The questions were referred to the measures actually implemented on the farms except in the fourth section of the questionnaire, which addressed the opinion of farmers and veterinarians.

Before initiating the study, the questionnaire was pilot-tested on six pig farms to ensure that the content, the interpretation of the questions and the responses were sufficiently clear. Pilot testing showed that the questionnaire took between 30 and 45 min to complete, and resulted in minor changes in the questionnaire format. The findings of the pilot-tested farms were not included in this paper.

### 2.3. Data analysis

Data entry, data coding and statistical analysis were performed using SPSS 17.0 (SPSS Inc., Chicago, IL, USA).

#### 2.3.1. Factor analysis

Factor analysis was used to condense the information contained in a large number of variables into a small set of new uncorrelated variables called factors (Hurnik et al., 1994). Given that the variables used to determine the biosecurity practices applied on farms are generally highly correlated, factor analysis was chosen for the analysis.

The categorical principal components analysis (CAT-PCA) was used to scale data measured at mixed coding levels using the maximum-total-variance method. This transformation is appropriate for data reduction when variables are categorical or ordinal. The transformed variables

Download English Version:

<https://daneshyari.com/en/article/5793875>

Download Persian Version:

<https://daneshyari.com/article/5793875>

[Daneshyari.com](https://daneshyari.com)