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A socio-psychological investigation into limitations and incentives concerning reporting a clinically suspect situation aimed at improving early detection of Classical Swine Fever outbreaks

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ABSTRACT

The aim of this study was to identify limitations and incentives in reporting clinically suspect situations, possibly caused by Classical Swine Fever (CSF), to veterinary authorities with the ultimate aim to facilitate early detection of CSF outbreaks. Focus group sessions were held with policy makers from the veterinary authorities, and representatives of veterinary practitioners and pig farmer unions. Personal interviews with a small group of pig farmers and practitioners were held to check limitations raised and solutions proposed during the focus group sessions. An electronic questionnaire was mailed to pig farmers and practitioners to investigate perceptions and attitudes with respect to clinically suspect situations possibly caused by CSF. After triangulating the responses of veterinary authorities, veterinary practitioners and farmers, six themes emerged across all groups: 1) lack of knowledge on the early signs of CSF; 2) guilt, shame and prejudice; 3) negative opinion on control measures; 4) dissatisfaction with post-reporting procedures; 5) lack of trust in government bodies; 6) uncertainty and lack of transparency of reporting procedures.

The following solutions to facilitate early detection of CSF were put forward: a) development of a clinical decision support system for vets and farmers, in order to get faster diagnosis and detection of CSF; b) possibility to submit blood samples directly to the reference laboratory to exclude CSF in a clinical situation with non-specific clinical signs, without isolation of the farm and free of charge for the individual farmer; c) decrease social and economic consequences of reporting CSF, for example by improving the public opinion on first reports; d) better schooling of veterinary officers to deal with emotions and insecurity of farmers in the process after reporting; e) better communication of rules and regulations, where to report, what will happen next; f) up-to-date website with information and visual material of the clinical signs of CSF.

INTRODUCTION

Outbreaks of notifiable contagious animal diseases (NADs), such as foot-and-mouth disease (FMD), avian influenza (AI) and classical swine fever (CSF), have large societal and personal consequences. Livestock farmers and veterinary practitioners are at the frontline of surveillance, and hence it is widely recognized that they play a key role in detecting first occurrences of NADs. In theory, notification of contagious livestock diseases by farmers to the veterinary authorities can be an effective early detection tool. Therefore, formal rules for reporting clinically suspect situations in livestock by farmers and veterinary practitioners are laid down in national and international legislation all over the world. In the Netherlands it all started with the Dutch Cattle Act, which was officially put into force in the year 1870 (Wester, 1939). It consisted of a list of contagious diseases like rinderpest, anthrax, rabies and FMD. Furthermore, it contained regulations for reporting of affected and suspect livestock to the mayor of the municipality by farmers; obligatory reporting by veterinary practitioners; isolation and prohibition of transport of sick and suspect livestock, etc. In essence, not much has changed with respect to the reporting and eradication process of NADs since those early days. Yet, we cannot conclude that the regulations produce a desired effect, because in spite of strict rules and regulations, experience has shown that the time between the first clinical appearance of a NAD and the actual reporting of farmers of clinically suspect situations to the veterinary authorities is often too long, resulting in extensive spread of the disease to other farms (Capua and Marangon, 2000; CFIA, 2004; Elbers et al. 1999, 2004; Gibbens et al., 2001).

Investigation of the scarce empirical evidence to date on issues concerning delayed reporting and underreporting of clinically suspect situations shows that the problem thus far has mostly been approached as a veterinary-technical problem (Elbers et al., 2006). If livestock farmers and veterinary practitioners are familiar with the clinical signs of a NAD, they are in the best

position to detect NAD suspects. However, often these diseases have not been in the country for many years or sometimes even decades, and farmers and some veterinary practitioners do not recognize the associated clinical signs any more (Elbers et al., 2002). Furthermore, many endemic animal diseases cause clinical signs similar to NADs. After a considerable period of freedom from NADs in a country, farmers and vets will have a tendency to think that clinical signs observed are caused by an endemic disease and not by a NAD. As a result, farmers fail to recognize the need to report these early clinical signs of NADs, which implies that the time needed for ultimate detection of a new infection would provide time for the disease agent to spread. For instance, many case reports indicated CSF was suspected only after prolonged medication had failed to produce desired results (Young, 1970; Elbers et al. 1999). Laboratory confirmation would be necessary in order to exclude NADs being the cause of the clinical problems observed. However, laboratory confirmation is in many national regulations only allowed after reporting to the veterinary authorities. Hence, asking for laboratory confirmation may lead to control measures, such as isolation of the farm, until the results of diagnostic testing are available. Moreover, isolation of the farm, especially if this happens for several days, may have negative economic consequences for the farmer.

Only recently, socio-psychological factors have become the focus of interest as possible predictors of delayed reporting of clinically suspect situations by farmers and veterinary practitioners. Results of a qualitative study among Australian sheep farmers on implementing biosecurity measures (Palmer et al., 2007) showed that one of the basic issues that may underlie the problem of not reporting clinically suspect situations to either the local agricultural department office or even a veterinarian may be a low level of trust in the government as well as agricultural extension agents. This lack of trust in government bodies also appeared as an important factor why farmers do not trust government information on improving biosecurity measures (Heffernan et al., 2008). This lack of trust is based on

negative personal experiences with the authorities, such as the way the government had responded to cases of infectious diseases in the past. A study into Norwegian sheep farmers' showing vigilance in reporting scrapie-associated clinical signs (Hopp et al., 2007), indicated that reporting was dependent on both economic and non-economic values. Among the economic values considered important by farmers were being offered free examination of NAD suspects. Knowledge of disease-associated clinical signs by farmers and worries about blaming oneself for experiencing the disease ranked high among the non-economic values.

Increasing the reporting rate and shortening the delay time for reporting is crucial, but it is complicated by the fact that little is currently known about the way farmers behave in possible clinically suspect situations, more specifically, their perception and appraisal of the situation, the decision process that follows, and the intentions and behaviors that flow from these perceptions and decisions.

The purpose of our study was to identify limitations and incentives in reporting clinically suspect situations possibly caused by CSF as perceived by veterinary authorities, pig farmers and veterinary practitioners, with the ultimate aim of improving early detection of CSF outbreaks.

METHODS

To learn more about why farmers decide to report or not to report clinically suspect situations of NADs, our study combined a qualitative and a quantitative research design. For the qualitative part of our study, focus group sessions were held with a group of policy makers of the Ministry of Agriculture (4 persons) that were among others responsible for animal health policy and regulation; the Food and Consumer Protection Authority (2 persons from the head office responsible for disease eradication) that is responsible for the actual emergency response when a suspicion is reported or an outbreak is detected; Board members of several

livestock sections from the Royal Dutch Veterinary Association (6 persons: livestock practitioners themselves, but with an interest in veterinary policy making) and with Board members of all three pig farmer unions present in the Netherlands (3 persons, also pig farmers themselves) to detect patterns and trends. Subsequently, personal in-depth interviews with 12 pig farmers (randomly selected from a registry of all Dutch pig farmers) and 5 veterinary practitioners (with pig farms in their practice, selected to be more or less representative for different geographical areas within the Netherlands) were held to check if there might be other limitations, solutions and incentives with respect to reporting clinically suspect situations as suggested in the focus group meetings. Most of them had experience with a CSF outbreak in their neighbourhood in the past (not necessarily on their own farm), some had experience with respect to a visit by the veterinary authorities to their farm due to reporting of a suspect clinical situation identified at the slaughterhouse. Based on the results of the qualitative research, an electronic questionnaire was sent via an e-mail newsletter to members of a large pig farmer organization and posted for three weeks on the website of the Royal Dutch Veterinary Association. The questionnaire was subdivided into four sections. Section a) asked when and under what conditions one would report a clinically suspect situation. Section b) asked about feelings and (economic) consequences one expected after reporting a clinical suspicion. These questions were formulated both for the case that, retrospectively, clinical signs would indeed turn out to be caused by CSF (true positive), as well as the situation that in retrospect it would become clear that this was not caused by CSF (false positive). Section c) asked about barriers for reporting; and d) about opinions on national regulation explaining when and how to report a clinically suspect situation. Finally, the questionnaire did not just probe into possible limitations, but also possible solutions to break down the barriers.

A grounded theory approach (Strauss and Corbin, 1998) was used to analyze the content of focus group and in-depth interviews. Each discrete incident, idea, or event was given a name or code word that represented the concept underlying the observation. Coded data were then isolated, reviewed, and interpreted line by line, to form categories and sub-categories until theoretical saturation was assumed (Patton 2002). Finally, categories and sub-categories were integrated to form substantive themes. Overall, six themes emerged from the data.

With respect to the electronic questionnaire, relative differences in opinions and attitudes between veterinary practitioners and pig farmers were tested with a χ^2 statistic (Statistix, 2000).

RESULTS

Focus groups

A summary of items indicated as limitations for reporting clinically suspect situations possibly caused by a notifiable pig disease by the veterinary authorities, veterinary practitioners and pig farmers is shown in Table 1. In Table 2, a summary of possible solutions put forward by the focus groups is shown. After triangulating the responses of veterinary authorities, veterinary practitioners, representatives of farmers organizations and pig farmers in the focus groups and in-depth interviews, six themes emerged across all groups.

Theme 1. Lack of knowledge on the clinical signs of CSF

During group discussions, government officials expressed their concern that farmers and perhaps even veterinary practitioners might be unfamiliar with clinical signs associated with CSF. Outbreaks of some diseases have been more than ten years ago, and this might be a major cause of not reporting clinically suspect situations possibly caused by CSF. Farmers in The Netherlands have more freedom for diagnosing and treating the animals themselves. A

large proportion of pig farms (in majority sow farms) are visited every month by a veterinary practitioner in the framework of an Integrated Quality Control Agreement. Within this framework, pig farmers are allowed to have a stockpile of antibiotics enabling treatment of pigs for the period between visits of the veterinary practitioner and they are allowed to treat their animals with these antibiotics without notifying their veterinary practitioner. Small pig finishing farms might see their veterinary practitioner once every two months. During the visit by the veterinary practitioner, the use of the antibiotics is discussed with the farmer. There is an obligation by law in the Netherlands (MANFQ, 2005) that pig farmers submit blood samples (to exclude CSF) to the laboratory within 24 hours after a group of pigs with clinical signs of an infectious disease are treated with medicines. Right after the large CSF-epidemic in 1997-1998 in the Netherlands, a considerable number of farmers complied to this regulation, but in the years after it trickled down to less than a 50-100 submissions annually (FSA, 2003) In order to make an accurate clinical diagnosis, knowledge about clinical signs associated with pig diseases is an important job competency for pig farmers. Overall, farmers agreed that the first risk assessment is made by the farmer himself. Several farmers admitted they might not be able to recognize certain NADs. For example, when presented with written cases of pigs with early clinical signs of CSF, many farmers responded that they saw these symptoms at least once a week, but did not think it could be caused by CSF. In reality, half of these cases were real life cases of CSF.

Theme 2. Guilt, Shame and Prejudice

Public opinion and social norms were identified by farmers as significantly influencing their practice of biosecurity. Farmers interviewed in our study felt that if they reported, and especially if they would be the first farmer to report, other farmers might think they had done something wrong. This relates to Theme 1, namely many people have erroneous opinions on

how diseases spread. A reflection from the focus group meeting: …."Many people would agree that farmers with poor hygiene who have illegal practices run a higher risk to introduce an animal disease on their farm. Hence people who admit they may have an animal disease on the farm are afraid others may think they are unhygienic and have illegal practices". A farmer commented that farmers who are the first to report “should be made heroes in the public opinion instead of criminals.” Connected to this theme, many farmers expressed their dissatisfaction with the obtrusive “circus”, as they called the procedures after reporting. They referred to the visits of the specialist-team of veterinarians and governmental officials that investigate the seriousness of the report. In order to prevent eventual spread of the NAD, these officials park their cars outside the premises, and walk to the farm wearing white protective suites and carrying red suitcases with tests and instruments. In the densely populated agricultural areas in The Netherlands, where you can sometimes easily spot at least half a dozen farm houses in the flat scenery, this means that the village knows about a possible suspect situation within no time.

Individual farmers accused each other of giving the company interest priority over sector interest. “When farmers suspect animal diseases, they just quickly sell their suspect animals to the slaughter house and wait at least a few days before reporting, so that they can effectuate important deliveries before a possible isolation of the farm.” During group discussions, several individual farmers also admitted that they sold clinically suspect animals to the slaughter house, but not to other farmers. In sum, fear of destruction of personal image and being looked upon as a criminal, and fear of deteriorating social networks were among other reasons for not reporting possible early cases of a NAD.

Theme 3. Negative Opinion on Control Measures

Farmers held the opinion that the control measures applied by government officials in The Netherlands are long and tedious. After notification, in some cases farms may be isolated in the case animals are sampled to exclude a NAD until test results are announced. This normally takes less than 48 hours. However, in some occasions it may last longer, and the majority of farmers who had not had any experience with reporting NADs seemed all to know these exceptions from hearsay, and they were surprised to hear that in most cases isolation of the farm does not last very long.

Dutch farmers do not receive compensation for losses suffered during this period of examination after the notification, although farmers said that the financial "reward" of notifying NADs as quickly as possible is that the financial compensation for further consequences in case there is indeed a NAD, such as eradication, may be higher: healthy animals are fully compensated, sick animals are compensated for 50% and dead animals are not compensated.

Theme 4. Dissatisfaction with Post-Notification Procedures

Several farmers who had had experiences with notifying the authorities about clinically suspect situations were not satisfied with post-notification procedures. After notification, a team of three veterinarians visits the farm. These include the veterinary practitioner of the farmer, a veterinarian of the Animal Health Service, and a State veterinarian. In some instances in the past, governmental veterinarians had made a bad impression by showing lack of branch-specific knowledge when visiting a pig farm. In addition, farmers were dissatisfied if officials had displayed "detached and arrogant attitudes", and spend most of the time writing instead of personally talking to the farmers. Although in many cases farmers praised the professionalism and attitude of the specialist team, in some cases specialists were

perceived by farmers as people with limited knowledge on animal disease control. These experiences had de-motivating rather than a stimulating effect on farmers to report a next possible case of a NAD.

Theme 5. Lack of Trust in Government Bodies

Farmers not only know the governmental veterinarians from notification procedures, but also from other contacts, such as commodity inspections and eradication campaigns. Most officials currently are aware of the sensitive nature of the procedure after reporting, and are especially trained to deal with farmers' uncertainties and emotions while performing their duties. Their attitudes during commodity inspections, however, may be totally different, which relates to the different role they are fulfilling during these activities. Farmers do sometimes not discriminate between these roles, and know governmental officials only in their corrective role of commodity inspectors.

In addition, the results indicate that farmers have concerns about earlier animal disease interventions by government bodies. Farmers felt that during past NAD eradication campaigns, they were pushed aside and they were not in control of their business anymore.

Moreover, common to all the farmers was the belief that disease prevention measures launched by government authorities were not consistent and hence not fair. They felt that the government was often giving priority to trade and economic interests. A pig farmer made it clear by saying: "pig farms were the first to close down during an outbreak of FMD in the dairy sector, while dairy farms were allowed to sell their milk." Likewise, dairy farmers complained that pig farmers are allowed to continue long distance international transports, whilst they believe these transports are the major cause of infection. Overall, many farmers currently have a lack of trust in government officials and as a result find it difficult to accept

that government could or would work together with farmers to control NADs. This will be a challenge for both the government and farmers.

Theme 6. Uncertainty and Lack of Transparency of Notification Procedures

Farmers lacked insight into reporting procedures and, perhaps more importantly, the process that would follow after a notification. The uncertainty about how long the farm might be closed, already mentioned under Theme 3, is but one example of the uncertainty about possible consequences of a notification. Tension caused by uncertainty starts with the fear of the actual result. Farmers hope for negative test results, but once they have notified the authorities, they often expect that the test results will be positive. Farmers expressed the need for a web-site that you could regularly visit to check the progress of the notification, or a phone number that you could call. Uncertainty also reflects in complaints about the specific steps in the notification procedure, such as making the first telephone call to the veterinary authorities. In all cases the farmers felt that the person answering the calls needed to be an expert with whom they could discuss the seriousness of their report. However, in practice the person answering the phone is an administrator and not an animal disease expert.

Transparency and confidence in the information that is presented are prerequisites for controlling animal disease outbreaks. Currently, farmers were hesitant in using formal channels because they felt that these sources of information were not up to date or reliable. As one pig farmer put it: "you can find more information through informal channels than through formal ones".

Questionnaire

A total of 75 pig farmers and 334 veterinary practitioners responded to the electronic questionnaire. The quantitative study covered topics related to Themes 1 to 6 of the

qualitative study. Results of the quantitative study underscored the qualitative results. However, pig farmers and veterinary practitioners differed significantly concerning opinions and attitudes towards reporting clinically suspect situations. Highlights are shown in Table 3. Although both farmers and veterinarians were reluctant to report false alarms, this tendency was stronger for farmers than veterinarians. For example, farmers wanted more certainty before reporting to the authorities. When asked: “if you think that a clinical problem on your farm might be caused by CSF, how certain do you want to be before you report to the authorities?” 36% of farmers as compared to 20% of vets (χ^2 statistic, P=0.003) needed more than 80% certainty,

while 15% of farmers as compared to 7% of vets (P=0.03) needed more than 90% certainty before they would report. In addition, a total of 40% of farmers and 49% of vets indicated that reporting a suspect situation, when retrospectively this was false alarm, had a (very) negative consequence for the financial situation of the farm. Such situations are expected to affect the relationship between farmer and vet: 5% of farmers and 23% of vets (P < 0.001) indicated that such an event would have a (very) negative influence on the relationship between farmer and vet. More farmers (57%) than vets (13%) indicate that they would report (much) faster a suspicious clinical situation when there is a strong relationship between a farmer and his vet (P< 0.001). Farmers (29%) and vets (31%) indicate that the fuss linked to reporting a suspect situation is often a reason for not reporting such a situation. The threat of paying a possible penalty for negligence is perceived as an important reason to report a suspicious clinical situation by a large minority of farmers (45%) and vets (31%) (P=0.02). Farmers (36%) and vets (20%) feel it is more terrible to report a suspect situation, when retrospectively this was false alarm, than to have missed a possible case of CSF (P=0.003). Guidelines in the legislation and regulations explaining when and how to report a clinical suspect situation

possibly caused by CSF, are perceived as: 1) clear by only 34% of farmers and 33% of vets; and well thought-out by 24% of farmers 24% of vets.

DISCUSSION

A response of 75 pig farmers with respect to the electronic questionnaire was considered low (estimate of response rate around 5%), the response of 334 veterinary practitioners was considered good (estimate of response rate around 40%). The subject of reporting clinically suspect situations possibly caused by NADs to the veterinary authorities is considered a sensitive item within the livestock industry, and this might be an important reason why not many pig farmers have taken the time to respond. Nevertheless, results of the quantitative study underscored the result of the qualitative studies and we are therefore confident that we have captured what is felt by farmers and practitioners in the field.

If a pig farmer is familiar with the clinical signs of CSF, he is in the best position to detect this disease, because he is on the frontline of animal disease identification and responsible for biosecurity measures. Our qualitative findings demonstrated that biosecurity behavior (practices employed on farms to prevent and/or control disease) are influenced by levels of awareness or knowledge about biosecurity, which is in line with previous research (Delabbio et al., 2003, 2004, 2005; Lawson et al., 2001; Heffernan et al., 2008). Farmers' knowledge and awareness of the disease and their willingness to report the disease, was called vigilance towards disease by Hopp et al. (2007). A recent study by Elbers et al. (2007) revealed that Dutch pig farmers have a rather limited knowledge on clinical signs of CSF: 33% of pig farmers could mention maximally three clinical signs associated with CSF (all of them late in the disease process) and 7% of pig farmers was not able to mention one single clinical sign of CSF and said they were entirely dependent on the veterinary practitioners' ability to judge a clinically suspect situation. The results of the present study also support the

impression that a considerable proportion of pig farmers put the responsibility for judging a clinically suspect situation completely in the hands of their practitioner. It should be noted that in the course of the decision process to report a clinically suspect situation, the pig farmer is still the first person to recognize that something is wrong with his pigs and that he is in need of the judgment of his practitioner. As mentioned during the focus-group meetings, pig farmers in the Netherlands have the authority to treat their animals with antibiotics out of a stockpile (four weeks worth of treatment) obtained from their veterinary practitioner. Therefore, there is a risk that pigs with early clinical signs of CSF are treated first (with antibiotics) for several days, and when the treatment does not have the desired effect, finally a practitioner is consulted for his judgment.

Linked to this item is the call from pig farmers and veterinary practitioners for internet-based information with up-dated photo- and video-material of clinical signs of NADs in pigs of different ages. Summarizing, there is a need for continuous training of pig farmers and veterinary practitioners with respect to recognizing (early) clinical signs of CSF. This can partly be facilitated by offering web-based information.

The results of our present study indicate that both farmers and veterinary practitioners would report a clinically suspect situation much quicker, if clinical signs of CSF would be more specific. However, the lack of specificity of clinical signs of CSF to detect an outbreak, especially in the early stage of the disease process, is an important barrier for early detection. To supply veterinary practitioners with an additional tool for identifying CSF-suspect situations as early as possible, a clinical decision-support system (CDSS) for use on-site is being developed (Geenen et al., 2006; van der Gaag et al., 2008). When a pig farm with clinical problems is visited, the CDSS leads the veterinary practitioner through a list of questions related to the clinical diagnosis of CSF. The answers are entered into a probabilistic network, which returns the probability of the pigs having a CSF infection together with an

advice how to act. The network includes over 40 variables, of which more than half of them can be observed upon clinical investigation, more than 80 relations between these variables and over 2000 conditional probabilities linking events within the network. The variables capture processes in the underlying pathogenesis, risk factors, relevant clinical signs and various alternative explanations for these signs.

Farmers lacked insight into reporting procedures and, perhaps more importantly, the process that would follow after a notification. A high level of transparency of the notification process, and what to expect after notification would help to decrease the uncertainty farmers feel. Furthermore, transparency with respect to the notification process will help to build-up trust of the farmer community in the veterinary authorities, and trust in each other might prove to be a key issue in trying to improve early detection of NADs. A clear explanation of the National Guidelines explaining when, what and how to report a clinical suspect situation, and a transparent decision-tree on what to expect in time after the notification up to the final decision to clear the farm of suspicion or to isolate the farm because of a laboratory confirmation of an infection with a NAD, would be helpful. This can be facilitated by the veterinary authorities by means of offering web-based information.

It is without discussion that if there are disease-specific clinical signs or other not-to-miss signs like progressive and exponential mortality, there should be immediate reporting to the veterinary authorities. However, in practice these black-and-white situations do not often occur. In-between the black-and-white situations that clearly there is - or there is no – clinical indication for a suspicion of a NAD, there is a large grey area where a farmer and veterinary practitioner can not totally rule-out a notifiable disease solely on the basis of a clinical inspection. And this will be more the case if you are looking at the beginning of the disease process, when non-specific signs will gradually show in a few animals. The possibility to submit samples from selected animals of pig farms by veterinary practitioners to a reference

laboratory in the case of non-specific clinical signs, to rule-out disease caused by a CSF, without involvement of the authorities and without isolation of the farm, might be a solution to increase the probability of early detection (Elbers et al., 2007). The alternative is that farmers will wait for several days, use medication for an extended period of time to solve the increasing problem, until one realizes too late that one is hit by a catastrophe because the clinical problems have accumulated exponentially. This tool is in operation in the Netherlands, and was started when there was a direct threat due to CSF-outbreaks in Germany close to the border with the Netherlands in the Spring of 2006. However, after the direct threat had disappeared in 2006, the use of the tool became very limited. This is a bit surprising, because it can be imagined that there would be several situations in which one would like to rule out CSF in a situation in which CSF is not the first on the differential diagnosis list to think of as a possible cause for the clinical problems seen in a pig farm. Farmers and veterinarians indicated that the costs for the individual farmer to use this tool (taking blood samples, veterinarian visits, sending samples by mail to reference laboratory) are still too high. They propose to have these costs being covered by the central emergency fund, because their use of exclusion diagnostics is to protect the sector for a disaster, and there should not be financial barriers for the individual farmer to do so. The veterinary authorities indicate that they have gone far to facilitate the use of this additional tool and are not willing to go any further. The impasse has to be broken to make new progress, communication and building trust between veterinary authorities and farmers should be a first start.

There seems to be a gap between what the authorities expect from pig farmers and veterinary practitioners regarding reporting a clinically suspect situation and what pig farmers and vets really feel as their responsibility. There is a common belief among pig farmers and farmer unions that NADs are the primary responsibility of the government. Changing such an attitude and thinking will take a huge effort in communication preparation and time.

Important requirements to achieve that goal are: a credible communicator, a high level of similarity between the audience (farmers) and the communicator, and finally the message and the communicator must be perceived as trustworthy (Heffernan et al., 2008). Since government bodies are not perceived as highly credible and/or trustworthy by livestock farmers (Bennet and Cooke, 2005; Hood and Seedsman, 2004; Poortinga ety al., 2004; van Haaften et al., 2004)), there is a specific need for a figurehead arising from the pig industry to take on that challenge.

It appears that the relationship between farmer and practitioner plays a role in the willingness to report a suspect situation, and that there is also an area of tension between farmer and vet if it comes to reporting (retrospectively) a false alarm: “do I (farmer) trust the competence of my vet?” and “Am I (vet) loosing a client (farmer) if my reporting is a false alarm?” Our present study indicates that vets have a much more negative image of the consequences of a false alarm for the relationship between farmer and vet than the farmer has. This would call for recalibration of the relationship between vets and farmers by the vets.

RECOMMENDATIONS

From our present study, the following recommendations are made to facilitate early detection of CSF: a) development of a clinical decision support system for veterinary practitioners and farmers, in order to get faster diagnosis and detection of CSF; b) possibility to submit blood samples directly to the reference laboratory to exclude CSF in a clinical situation with non-specific clinical signs, without isolation of the farm and completely free of charge for the individual farmer (group interest paid by communal funds); c) decrease social and economic consequences of reporting CSF, for example by improving the public opinion on first reports; d) better training of governmental employees to deal with emotions and insecurity of farmers in the process after reporting; e) better communication of rules and regulations, where to

report, what will happen next (decrease insecurity, increase sense of control); f) up-to-date website with information and visual material of the clinical signs of CSF.

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CONFLICT OF INTEREST STATEMENT

None

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Table 1. Items indicated by focus groups as limitations with respect to reporting a clinically suspect situation on a pig farm possibly caused by Classical Swine Fever (CSF)

Item	Veterinary authorities	Veterinary Practitioners	Pig farmers
1. Difficulties with risk assessment	Unfamiliarity with clinical signs of CSF, especially with farmers and veterinary practitioners with only few pig farms as clients. More problematic if last outbreak is some time ago. Farmer perceives risk of having CSF higher for neighbor than for his own farm	There is a large grey area, e.g. increased mortality combined with non-specific clinical signs. There are several (non-defined) factors playing a role in the decision process to report a suspicious situation. Even with very high mortality, some farmers do not think there is a real problem. Related problem: farmers applying medication (no supervision and correction by veterinary practitioner)	You make your own risk assessment of the probability that the clinical problems on your farm are caused by CSF, and you do not call in a second opinion in order to prevent negative (financial) consequences
2. Characteristics of disease		The higher the probability of infection, the faster one would report. When there are no outbreaks in neighboring countries, the probability of infection is estimated to be low	There is a high probability that clinical problems are not caused by CSF and therefore it is difficult to report such a situation. You want to prevent raising a false alarm. If you are very sure it is CSF, you want to report as soon as possible
3. Negative consequences	Both for farmers as for veterinary practitioners. They are both vulnerable due to specialization. When there is a real outbreak, limitation of movement or stamping-out policy applied in neighborhood may lead to the question of guilt	Especially the social consequences are high when a false alarm is raised (strangers on the premises). Farmers are not willing to spend money on medical treatment of their animals and super-vision, especially if it concerns the protection of the interests of the pig industry as a whole when they think it is not in their own personal interest	Consequences will play a role on the background. It is felt as very negative that others (authorities) take over the farm during an investigation of a suspicion, you are not your own master anymore on your own farm
4. Guilt, shame and prejudice	Farmers having a CSF outbreak are perceived as being non-hygienic, and have illegal businesses	Farmers do not want to have strangers with unfamiliar cars on their premises to be seen by the neighbors or have the major of the town visiting them in the evening for a serious talk	The farmer that is reporting should be treated as a hero, he takes responsibility for the pig industry as a whole. In practice he is looked upon as a criminal
5. Earlier experience with reporting	Association between earlier negative experiences and tendency to not to report too quickly	If you have reported once, the next time will be easier, you know what will happen	A considerable number of negative examples are known in the farmer community. Experiences will not be motivating, rather demotivating
6. Negative image and mistrust of veterinary authorities	Farmers and veterinary practitioners have a negative image of the veterinary authorities due to experiences with procedural mistakes and lack of expertise of veterinary officers	Perceived unfairness with respect to the reporting station. There is no possibility to discuss with the reporting station to come to a mutual conclusion. The person answering the phone has no veterinary knowledge. The officer visiting the farm is sometimes not competent. State veterinary officers sometimes have a bad hygienic consciousness	The specialist team visiting the farm are sometimes arrogant, there is too much focus on external appearances. Farmers feel intimidated, they feel not to be one's own master anymore on their own farm, you are not involved (as an equal partner) in the discussions on what disease could have caused the clinical problems on the farm

1 (continued)

7. Unclear procedures		Especially the case with non-experienced people	Protocols used by the veterinary authorities change too often, and as a consequence you don't know what you are up to. Via informal channels you know more than via formal channels
8. Don't recognize ethical component	The consciousness for ethical principles will continuously decrease (in veterinarians) the day they leave vet school and start working in a veterinary practice	There is only a small core group of active veterinary practitioners in the field that is concerned about this item	Other livestock industries don't take their responsibility highly (e.g. poultry with respect to Avian Influenza), but pig industry is very responsible
9. Conflict of interest	Believe that farmers will postpone a report of a suspicious situation until a planned shipment of pigs is executed; that farmers will quickly ship-out pigs when there are rumors of a CSF outbreak; that the pig industry is doing business with dubious countries although they know what is going on in those countries; Farmers, traders, veterinary practitioners (farmer as client) all have strong personal interests	The interest of the individual farmer (economic) versus public health interests; interest of veterinary practitioner : integrity versus a good relationship with client; interest of individual farmer versus interest of industry	The interest of the individual farm/farmer is often the most important
10. Non-transparent or conflicts in legislation		in animal sectors (dairy in cattle industry, broilers in poultry industry) with frequent contact between farmer and practitioner, unclear procedures or legislation is not a problem because you will fix the problem together. In other sectors (e.g. pig finishing farms) with less contact, you need all the support of the law to keep your back straight	
11. Procedural injustice			Legislation is often arbitrary, authorities only awake when there is a need for "excluding CSF as cause of problems". Where is the right cut-off ? Do we have to be 5%, 20% or 80% certain that we have the disease before we want to exclude CSF ? Farmer is always blamed, but he is the least competent to take the decision. During the Foot and Mouth Disease outbreak in 2001, there was no FMD in pigs, but pig farms were isolated for a long period, while dairy farms could continue to ship off milk from their farms

Table

2. Solutions for limitations with respect to reporting a clinically suspect situation on a pig farm possibly caused by Classical Swine Fever (CSF), as indicated by focus groups

Solution	Veterinary authorities	Veterinary practitioners	Pig farmers
1. Shortening of isolation period	Is already accomplished for CSF due to use of PCR test	A procedure for fast exclusion of a possible NAD causing a suspect but non-specific situation must be made available	Is already reasonably short, about 24 hours is feasible for many pig farmers to wait
2. Reducing social consequences		A minimum of publicity, no external signs	No cars near the farm with man wearing “space outfits” and carrying red suitcases.
3. Improved procedures		Make it possible to have a soft reporting: exclusion diagnostics in a situation with non-specific clinical signs, without isolation of farm	Make soft reporting possible: exclusion diagnose-tics in a situation with non-specific clinical signs, without isolation of farm; consultation with farmer on test result; a more coaching role for the vet, not only telling that it is not CSF, but also telling what is causing the problems; procedures of a reporting should be trans-parent, you should be able to discuss your intention to report with a competent person from the authorities before you really report; Diagnostic testing, which is in the interest of the industry as a whole, should be made available without costs for the individual farmer
4. Better tests	A more accurate and reliable diagnostic test, not sure if this should be made available on-site ?	A fast diagnostic result after testing; testing done by practitioners themselves; testing to exclude a “possible not situation”; availability of on-site tests	A fast, accurate and reliable diagnostic test that is 100% accurate during reporting; make a second-opinion available for farmers
5. Better communication between authorities and farmers	In the winter period or because of a higher awareness due to outbreaks in neighboring countries, have presentations about notifiable diseases	More frequent consultation between authorities and the Royal Netherlands’ Society of Veterinary Science about specific reports of clinically suspect situations (debriefing) and protocols	Communication skills of state veterinary officers have to be improved. The obligations and rights of the farmer during a visit by a specialist-team should not be handed over in the form of a written statement, but should be addressed orally. A complaints service should be made available with respect to handling a report of a suspicion by the authorities
6. Education			State veterinary officers have to learn to deal with emotions of a farmer during a visit by specialist team; officers have to have more knowledge about animal husbandry and animal diseases
7. Costs of testing not for individual farmer	Start a campaign to promote use of PCR test by veterinary practitioners and farmers		Costs are not necessarily the problem, but it is a matter of principle

Table 2 (continued)

Solution	Veterinary authorities	Veterinary practitioners	Pig farmers
8. Financial reward to support disease control	Rewarding a report from a communal fund (filled by industry and government)		Nonsense, pig farmers take the financial risks of their own farm very serious and would report if there is really a CSF suspicion
9. Punishment	Lift the cut back in compensation when administrative mistakes by farmer are ascertained during farm visit by authorities, is very demotivating for the farmer and has led to many, non-satisfactory jurisdictional problems		It is good to tackle free-riders (individual risk-takers); Livestock sector that creates the problems should pay for other sector e.g. in case of FMD starting in cattle. Perform a risk analysis and have animal sectors pay to the communal fund on the basis of risk analysis (pig sector thinks they have better biosecurity than other animal sectors, in particular the cattle sector)
10. Support for veterinary practitioner	Development of a clinical decision-support system for early detection of CSF	An intermediate, a service you could contact to discuss your clinical findings and to decide if you should report the situation to the authorities: an expert system or a competent person you could consult by phone (second opinion)	As soon as a veterinary practitioner has made a report, the vet has to make a decision: do I only concern myself with the possibly infected farm (vet does not get paid for this time investment), or do I concern myself with other pig farms. If the vet picks up normal routine, the feedbacks from the "infected farm" to the vet will stop. Communication about what is going on should be continued. Complaint: test results are not send to vet or farmer first, but firstly the veterinary authorities are informed (seen by farmers as the bogeyman)
11. Support for farmer : internet-tool			A website with video and photo material of clinical signs of CSF; information on when, what and how to report a suspicion and description of follow-up process, what to expect after reporting
12. Ethical consciousness	Refresher courses for veterinary practitioners	Distribute information via newsletter of pig producers on ethical problems; scientific meetings for veterinary specialist groups	
13. Anonymous squeal phone line	Will not work, everybody will cover for each other	Do not report without telling the farmer, otherwise you will loose trust of farmer; reporting without consent of farmer will create problems for veterinary practitioner	
14. More transparent and specific legislation		Specific and unequivocal legislation (use practical field knowledge from veterinary practitioners)	Transparent and unequivocal protocols used by veterinary authorities; easy to be found by people who need them (via internet)

Table 3. Responses by Dutch pig farmers and veterinary practitioners to the electronic questionnaire study

Item / questions	Reporting behaviour		Difference between farmers and vets: P-value of χ^2 – statistic
	Farmers (in %) N=75	Vets (in %) N=334	
When and under what conditions would one report a clinically suspect situation ?			
If you think on your farm a clinical problem might be caused by CSF, how certain do you want to be before you report ? ≥ 50%	61	51	0.10
≥ 80%	36	20	0.003
≥ 90%	15	7	0.03
If I think there is a small chance of CSF on my farm, I shall wait a few days to see how disease is developing before reporting	36	54	0.005
If I think there is a small chance of CSF on my farm, I will seek a second opinion before I report it	57	72	0.01
Probability of an outbreak of CSF at my farm or clients is negligible	27	5	< 0.001
I would report (much) faster a suspicious clinical situation when there is regular introduction of new animals on the farm	49	60	0.09
I would report less quickly a suspicious clinical situation when general hygienic measures on a farm are good	57	77	< 0.001
Farmers and vets have a well thought-out plan in their head how to react if encountering a situation that asks for reporting CSF	38	49	0.10
I would report (much) faster a suspicious clinical situation when clinical signs of CSF are more specific	28	49	< 0.001
I would report (much) faster a suspicious clinical situation when there is a strong relationship between farmer and vet	57	13	< 0.001
Feelings and (economic) consequences one expected after reporting a clinical suspicion			
Reporting a suspicion, when retrospectively this was a false alarm, has a (very) negative financial consequence for the farm	40	49	n.s[#].
Reporting a false alarm, would have a (very) negative influence on the relationship between farmer and vet	5	23	< 0.001
Reporting a suspect situation, when retrospectively this was really caused by CSF, would have a (very) negative influence on the relationship between farmer and vet	3	7	n.s.
Barriers for reporting			
I trust that all pig farmers will do their utmost to prevent an outbreak of CSF in the pig sector	45	43	n.s.
The obligation by law to report a clinically suspect situation is the most import reason for reporting	40	39	n.s.
The fuss linked to reporting a suspect situation is often a reason for not reporting	29	31	n.s.
The difference in compensation between sick and dead animals is a good stimulus to report	56	44	0.06
The threat of possibly paying a penalty for negligence is perceived as an important reason to report a suspicious clinical situation	45	31	0.02
It is more terrible to report a suspicion, when retrospectively this was a false alarm, than to have missed a real case of CSF	36	20	0.003
The decision to report or not to report a suspicion of CSF is totally in my hands	32	72	< 0.001
Opinion on national regulation explaining when and how to report a suspicion			
National Guidelines explaining when and how to report a clinical suspect situation, are perceived as: - Well-thought out	24	24	n.s.
- Clear	34	33	n.s.
There is a need for more information (website: photos, video) on CSF characteristics (clinical signs, transmission routes etc.).	25	60	< 0.001

[#] n.s. : not significant (P > 0.10)