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Application of biosecurity in different production systems at individual, country and regional levels

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Summary: *The OIE Regional Commission for Europe recognises the crucial importance of implementing biosecurity measures in different production systems in the whole region, in line with OIE standards. Therefore, the Regional Commission decided to assign this topic to one of the two technical items to be presented and discussed at the 28th Conference of the OIE Regional Commission for Europe (Tbilisi, Georgia, September 2018). The aim was to look at the way biosecurity is applied across the Europe Region at individual country and regional level, analyse current strengths and weaknesses and identify best practices that could be of interest to all countries. This technical item was foreseen as a simple questionnaire to be sent to all Member Countries of the OIE Europe Region and supplemented by the collection of best practices; the survey was conducted in June and July 2018. This report presents the findings emerging from the survey.*

The key findings of the survey are as follows:

- *The majority of the responding countries (94.87%) have a legal base for the implementation of biosecurity in their veterinary legislation and 92.31% of them have biosecurity plans that are enforced. However, only half of the respondents (53.85%) indicated that their country had national funds to support the implementation of biosecurity.*
- *89.74% of the respondents have procedures in place to evaluate the implementation of biosecurity and the Veterinary Services are normally (94.59% of respondents) involved in inspecting the implementation of biosecurity plans.*
- *Some countries reported the existence of an independent Expert Group that checks the implementation of biosecurity and reports the outcome, including any non-compliance, to the Veterinary Authorities.*
- *Biosecurity plans mainly cover farmed animals: poultry and pigs are the production systems in which biosecurity plans are most frequently implemented. This is most likely linked to the recent epidemics of avian influenza and African swine fever in Europe.*
- *Biosecurity is normally targeted at commercial holdings. However, all holdings that have access to markets should be included in the biosecurity programme. Although non-commercial farms can be a dead end in terms of disease spreading, backyard units that sell animals at local or regional level can have a role in the spread of diseases.*
- *One of the respondents indicated that farmers are responsible for the implementation of biosecurity.*

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- *A few countries reported their experience with biosecurity plans in aquatic animals and in these cases the level of implementation is quite high.*
- *Examples of biosecurity requirements and plans were reported for avian influenza, African swine fever, salmonellosis, tuberculosis and aquatic animal diseases.*
- *When preparing a biosecurity programme, the role of swill feeding in spreading disease must be considered and, when relevant, properly mitigated.*
- *Examples of a voluntary programme to prevent the infection with Salmonella and other diseases in poultry have been reported. The aim of such programme is to improve poultry health, minimise the need for antibiotic treatments and minimise the risk of infection between livestock facilities and humans.*
- *The respondents highlighted the preventive measures they considered relevant to prevent diseases spreading from wild to domestic animals. Other disease control tools, such as vaccination, disease surveillance and culling of wild animals, were suggested as a means of enabling early detect of diseases or to prevent diseases spreading.*
- *Biosecurity during hunting was pointed out as a useful way of avoiding the spread of diseases in wildlife and from wildlife to domestic animals. The removal and safe disposal of the remains of hunted animals was reported as an efficient measure to prevent the spread of diseases and to collect samples for testing.*
- *In line with the previous findings, farmers and hunters are the stakeholders with whom collaboration has most frequently been established to implement or improve biosecurity.*
- *Countries have established partnerships with different stakeholders, depending on the disease to be controlled and the organisation of the Central Administration.*
- *Many respondents highlighted the relevance of awareness campaigns and training in promoting the implementation of biosecurity.*
- *Some respondents reported of the existence of online information and teaching tools, mobile data collection and epidemiological decision support systems to facilitate the spread of information, training of professionals and the management of veterinary activities.*

Introduction

Animal diseases are among the most significant limiting factors for livestock production. Their impact can vary from reduced productivity and restricted market access to the elimination of entire flocks or herds, with the resultant loss of biodiversity and valuable genetic resources. Some emerging or evolving infectious diseases have the potential to move quickly from local to international significance and to pass from animals to humans. Combating diseases of livestock in developing countries can make a substantial contribution to poverty alleviation by generating employment, providing funds for education and training, improving opportunities for trade in livestock and animal products and supplying raw materials to industry.

The World Organisation for Animal Health (OIE) has always been actively engaged in the prevention and control of the spread of animal diseases, including zoonoses. In fact, one of the main objectives of the OIE is to develop international standards to facilitate safe international trade in animals and animal products, and prevent and control animal diseases, including zoonoses, and promote animal health and welfare. These standards detail the OIE's requirements to prevent transmission of pathogenic biological agents to animals, humans and the environment, based on biosafety and biosecurity principles.

Progressive control pathways (PCPs) are increasingly used for the control of a number of animal diseases, including foot and mouth disease, peste des petits ruminants, brucellosis and rabies. The PCP encourages the development of national control plans that support strategies and the use of the various tools that promote disease control, including improved surveillance, vaccination programmes, public awareness campaigns and, in particular, enhanced biosecurity, the latter to be implemented through control of animal and product movements by quarantine, reduced mixing of different groups of animals, improved hygiene and sanitation practices, particularly with regard to animal examination and treatments and the handling of potentially contaminated food.

In the OIE *Terrestrial Animal Health Code*, **biosecurity** is defined as 'a set of management and physical measures designed to reduce the risk of introduction, establishment and spread of animal diseases, infections or infestations to, from and within an animal population'.

The Veterinary Services have a key role in maintaining and developing such measures, working in partnership with the various actors dealing with livestock (farmers, transporters, animal handlers and keepers, veterinarians, etc.) who are primarily responsible for biosecurity implementation. The Veterinary Services are charged with developing and maintaining biosecurity protocols at:

- Farm level and in other premises where livestock are kept, to protect animals from the introduction/spread of animal diseases,
- Regional level: during transportation, in the different production systems, in slaughterhouses and in livestock markets, to protect animals from the introduction/spread of animal diseases,
- Country level: to prevent the introduction and spread of transboundary animal diseases.

Recent socioeconomic studies on biosecurity knowledge, attitudes and practices in both developed and developing countries have shown that attention needs to be focused on the people involved and impacted by animal diseases. Research indicates that in most rural sectors, personnel generally have a poor understanding of biosecurity, the exception being some intensive commercial operations (mainly pigs, poultry and ruminant feedlots), but this situation could be improved through appropriate training and awareness campaigns.

The OIE Regional Commission for Europe is aware of the relevance of implementing biosecurity measures in different production systems, in line with OIE standards. Therefore, the Regional Commission decided to assign this topic to one of the two technical items to be presented and discussed at the 28th Conference of the OIE Regional Commission for Europe (Tbilisi, Georgia, September 2018). The aim was to look at the way biosecurity is applied across the Europe Region at individual country and regional level, analyse current strengths and weaknesses and identify best practices that could be of interest to all countries. This technical item was foreseen as a questionnaire to be supplemented with the collection of best practices. The survey was conducted in June and July 2018. This report presents the findings emerging from the survey.

The Regional Core Group, made up of the elected members of the Bureau of the Regional Commission and the regional members of the OIE Council, requested that the survey cover the main fields related to the implementation of biosecurity in countries, such as:

- Availability of a legal base for implementation of biosecurity in veterinary legislation, for specific production systems, and establishments (facilities), including farms, livestock markets, laboratories and slaughterhouses;
- Availability of national funds to support implementation of biosecurity measures or good farming practices (GFP) in the different production sectors;
- Collaboration with producers, other stakeholders and relevant authorities (e.g. farmers, hunters, public health, environmental protection) in implementation of biosecurity or GFP;
- Monitoring of implementation, or assessment of current practices;
- Enforcement of implementation of the biosecurity plans and state of play of veterinary inspection activities in different production systems related to biosecurity or GFP;
- Current level of control of biosecurity in relation to the use of antimicrobials and its effects on antimicrobial resistance;
- New technologies (apps etc.) and what the barriers are for industry or the Veterinary Services in improving biosecurity;
- Method for communicating the need for effective biosecurity.

To collect the information required to provide answers on the topics identified by the Regional Core Group, a questionnaire was developed, and a survey was conducted electronically by email with the support of the OIE Headquarters, which collated the responses and submitted them for assessment and analysis by the author.

This report provides a summary of the findings and preliminary conclusions from the survey.

Results

The 53 Member Countries of the OIE Regional Commission for Europe were invited to participate in the survey; 39 of them completed the questionnaire. The response rate to the survey was 73.58%. One country replied when the survey was already closed but the information provided was taken into consideration in the collection of best practices.

Armenia, Austria, Belgium, Bosnia and Herzegovina, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Georgia, Germany, Hungary, Iceland, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldavia, Netherlands, Norway, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Turkey, Ukraine, United Kingdom and Uzbekistan are the countries that completed the online survey.

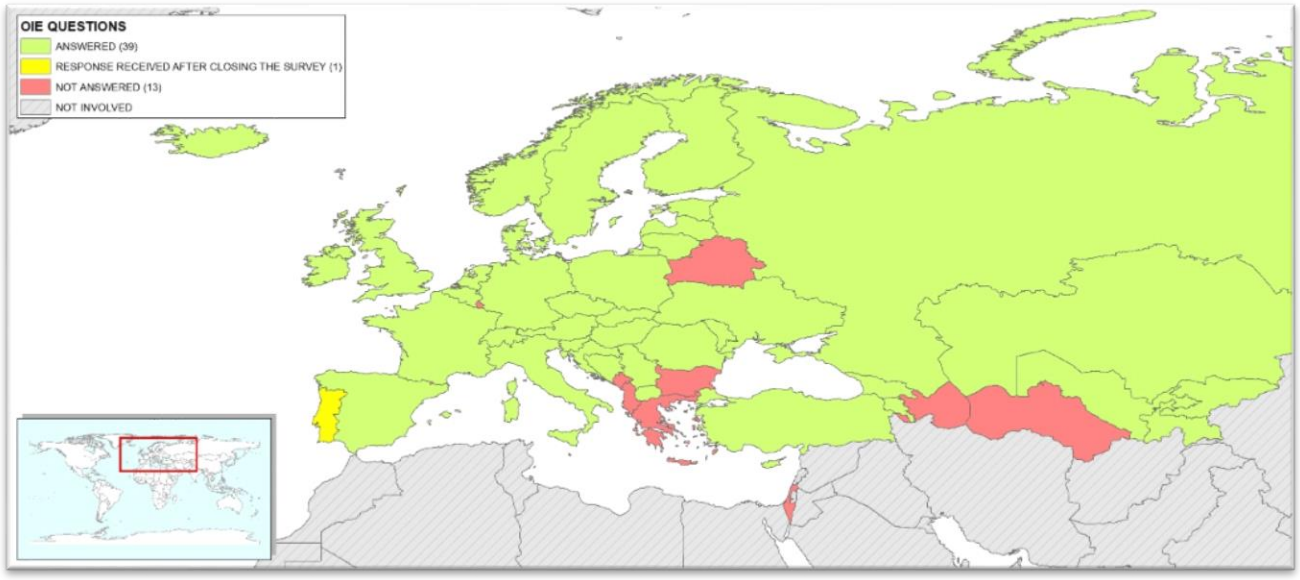
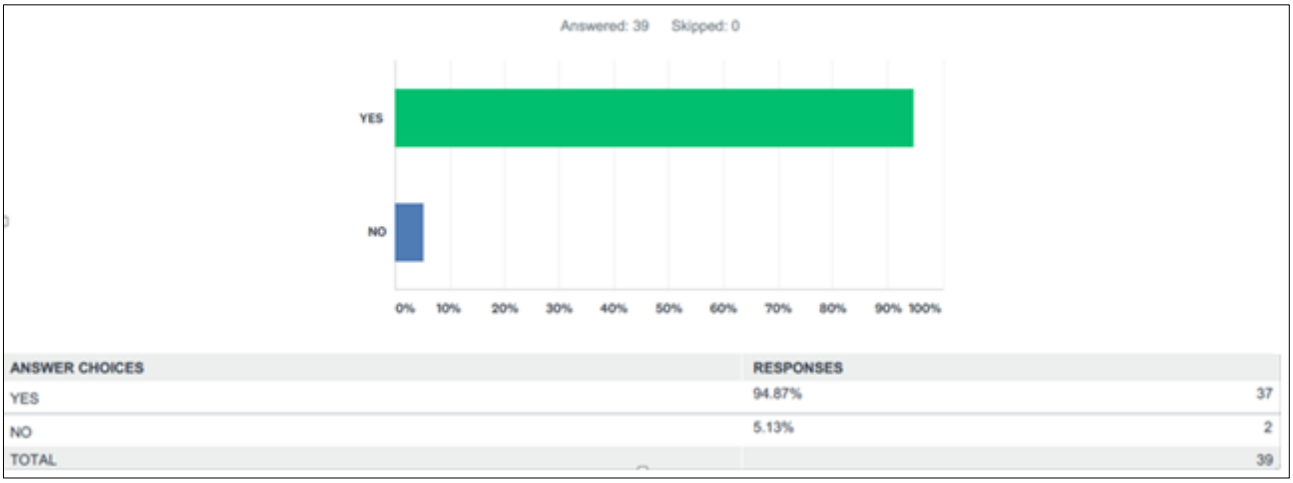


Fig. 1. Countries participating in the survey on the application of biosecurity

Q5. Does your country have a legal base for the implementation of biosecurity in veterinary legislation?

The response rate to this question was 100% and the majority (94.87%) reported that in their country a legal base exists for the implementation of biosecurity in veterinary legislation.

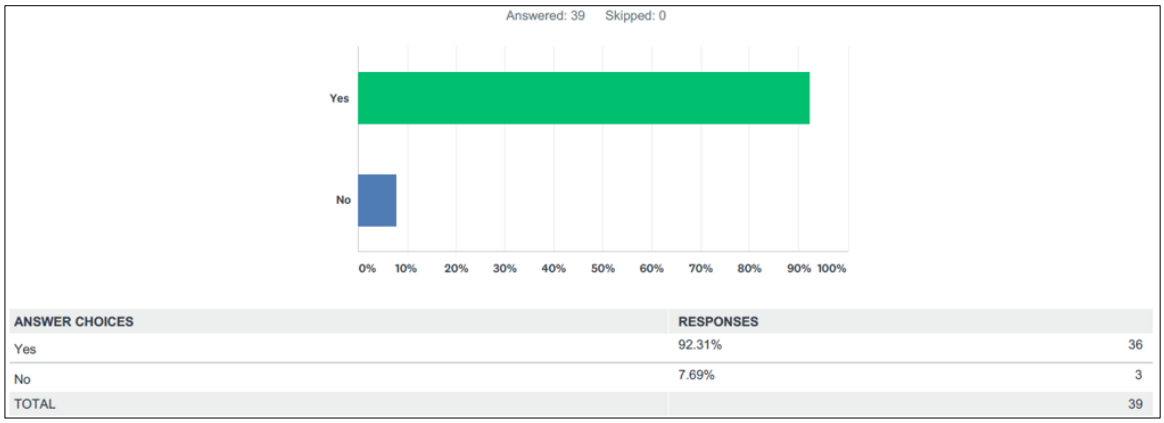


ANSWER CHOICES	RESPONSES	
YES	94.87%	37
NO	5.13%	2
TOTAL		39

Fig. 2. Countries having a legal base for the implementation of biosecurity in veterinary legislation

Q6. Does your country have biosecurity plans that are enforced?

The response rate to this question was 100%. The majority of the respondents (92.31%) reported that they have enforced biosecurity plans whereas 3 countries (7.69%) reported that they do not.



ANSWER CHOICES	RESPONSES	
Yes	92.31%	36
No	7.69%	3
TOTAL		39

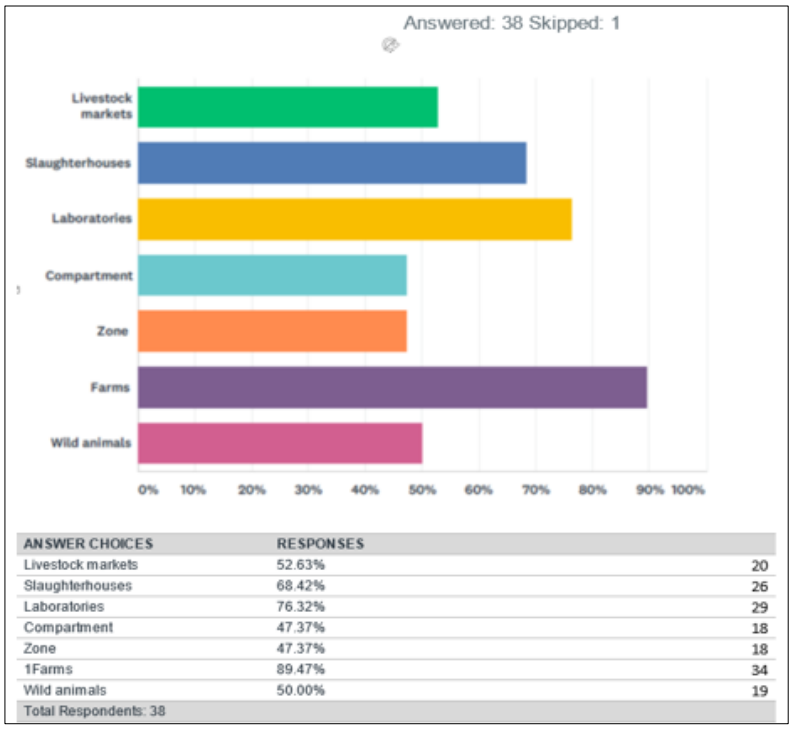
Fig. 3. Countries with enforced biosecurity plans

Q7. If the reply to question 6 is yes, please indicate to which of the following they apply

The response rate to the question was 97.43%; one of the respondents who answered 'yes' to Q6 skipped this question.

Farms and laboratories are the areas in which biosecurity plans are most frequently implemented, followed by slaughterhouses, livestock markets, wild animals, zones and compartments.

It is worth mentioning that 52.6% of the 38 respondents enforce biosecurity in all of the areas considered relevant for disease spreading (livestock markets, slaughterhouses, laboratories, farms, wild animals and when appropriate also in zone and compartment).



ANSWER CHOICES	RESPONSES	
Livestock markets	52.63%	20
Slaughterhouses	68.42%	26
Laboratories	76.32%	29
Compartment	47.37%	18
Zone	47.37%	18
1Farms	89.47%	34
Wild animals	50.00%	19
Total Respondents: 38		

Fig. 4. Areas in which countries have implemented biosecurity plans

Q8. If you ticked 'farms' in question 7, please indicate the animal species targeted, including aquatic animals

The response rate to the question was 89.74%. Biosecurity was reported to be applied to categories of farmed animals that included the following: swine, poultry, cattle, sheep, goats, horses, camels, bees, fur animals, game animals, and aquatic animals. Some respondents have also mentioned pets.

Swine and poultry were the production systems most frequently reported. In some instances, it was specified that biosecurity plans are only for commercial holdings.

Q9. If you ticked 'wild animals' in question 7, please briefly describe the biosecurity plan(s) of your country applied to wild animals

Respondents reported relevant measures to prevent the spread of diseases from wild to domestic animals. Some diseases, such as African swine fever, classical swine fever, tuberculosis, avian influenza and chronic wasting disease were reported as an example of national biosecurity plans applied to wild animal populations.

The following measures were suggested to mitigate the risk of disease spread: cleaning and disinfection, fencing and netting to ensure the confinement of domestic animals, collection of sick and dead wild animals, proper management of animal by products, avoiding hunting activity prior to being in contact with domestic animals, protection of watering points and restrictions on the use of salt lick for deer.

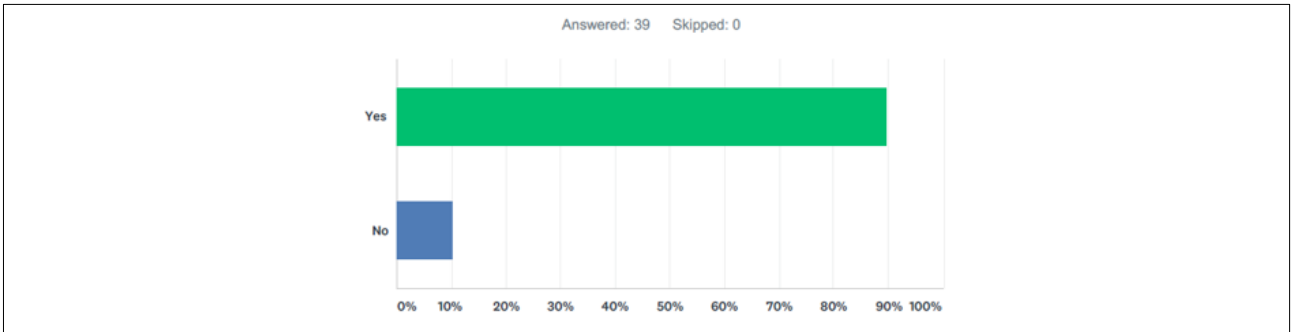
Biosecurity for hunters was mentioned by some respondents as important for avoiding the spread of diseases in wildlife and from wild to domestic animals. On the subject of African swine fever (ASF) and the measures to be applied in wild boar, reference was made to the African Swine Fever Strategy for the European Union, which foresees, in event of ASF occurrence, biosecurity requirements for hunters, during hunting, during sampling and in the management of the affected area.

Others disease control tools, such as vaccination, disease surveillance and culling of wild animals, were suggested as a means of enabling early detection of diseases or to prevent diseases spreading.

Many respondents highlighted the relevance of awareness campaigns and training in promoting the implementation of biosecurity.

Q10. Are procedures in place to monitor, assess and/or evaluate the implementation of biosecurity measures?

The response rate to the question was 100% and the majority of the respondents (89.74) reported having procedures in place.

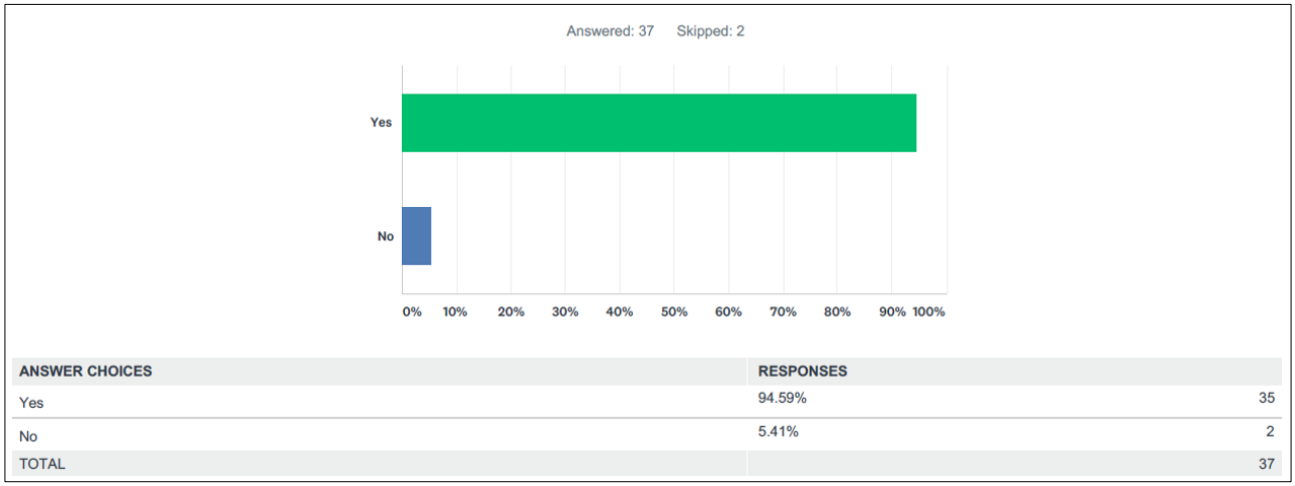


ANSWER CHOICES	RESPONSES	
Yes	89.74%	35
No	10.26%	4
TOTAL		39

Fig. 5. Countries having procedures in place to evaluate the implementation of biosecurity

Q11. If the reply to question 10 is yes, are the Veterinary Services involved in inspecting the implementation of biosecurity plans?

Not all participants in the survey replied to this question; two skipped the question. However, 94.59% of the respondents replied that the Veterinary Services are actively involved in inspecting the implementation of biosecurity.

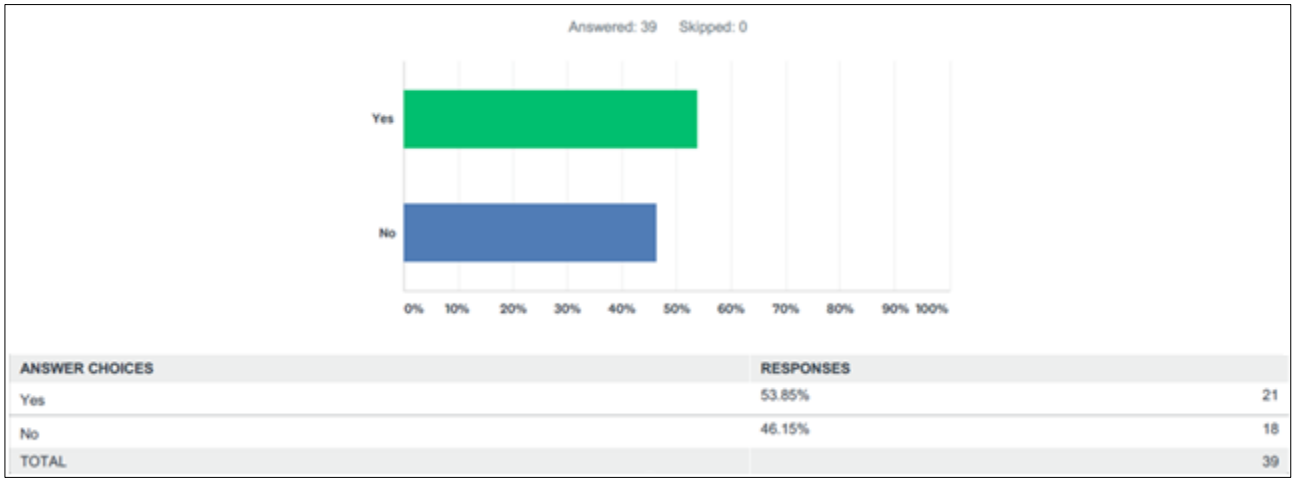


ANSWER CHOICES	RESPONSES	
Yes	94.59%	35
No	5.41%	2
TOTAL		37

Fig. 6. Countries with Veterinary Services involved in inspecting the implementation of biosecurity

Q12. Does your country have national funds to support the implementation of biosecurity measures or good farming practice (GFP) in different production sectors?

The response rate was 100%, 53.85% of the respondents replied that their country has funds to support the implementation of biosecurity whereas 46.15% replied that their country does not.

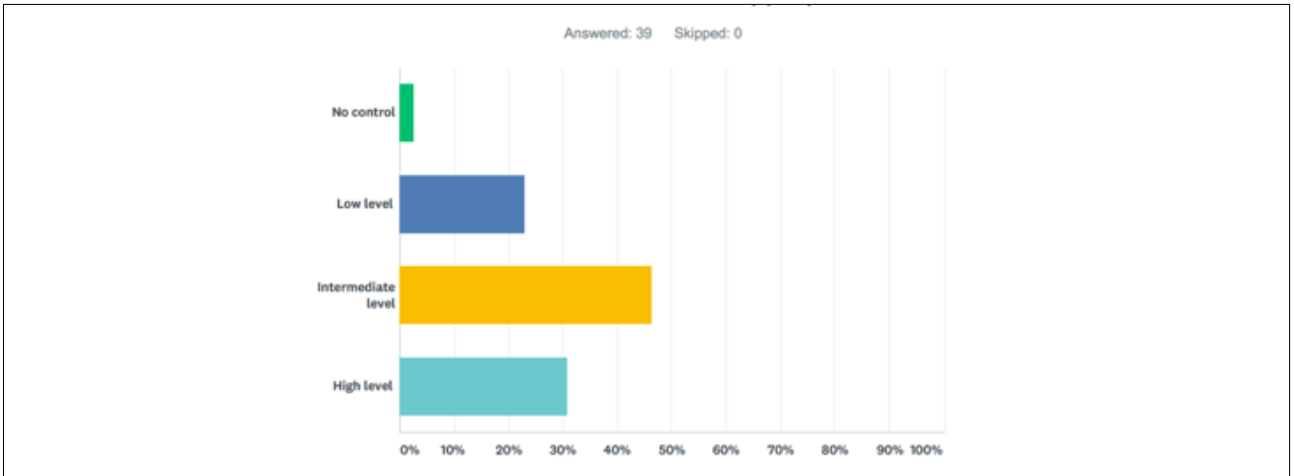


ANSWER CHOICES	RESPONSES	
Yes	53.85%	21
No	46.15%	18
TOTAL		39

Fig. 7. Countries having national funds to support the implementation of biosecurity measures or good farming practice (GFP) in different production sectors

Q13. In your country, what is the current level of control of biosecurity in relation to the use of antimicrobials? Please tick the appropriate box.

The response rate to the question was 100%. About half of the respondents (46.15%) reported that they have an intermediate level of control over biosecurity in relation to the use of antimicrobials, 30.77% reported a high level, 23.08% reported a low level and 1 respondent (2.56%) reported no control.

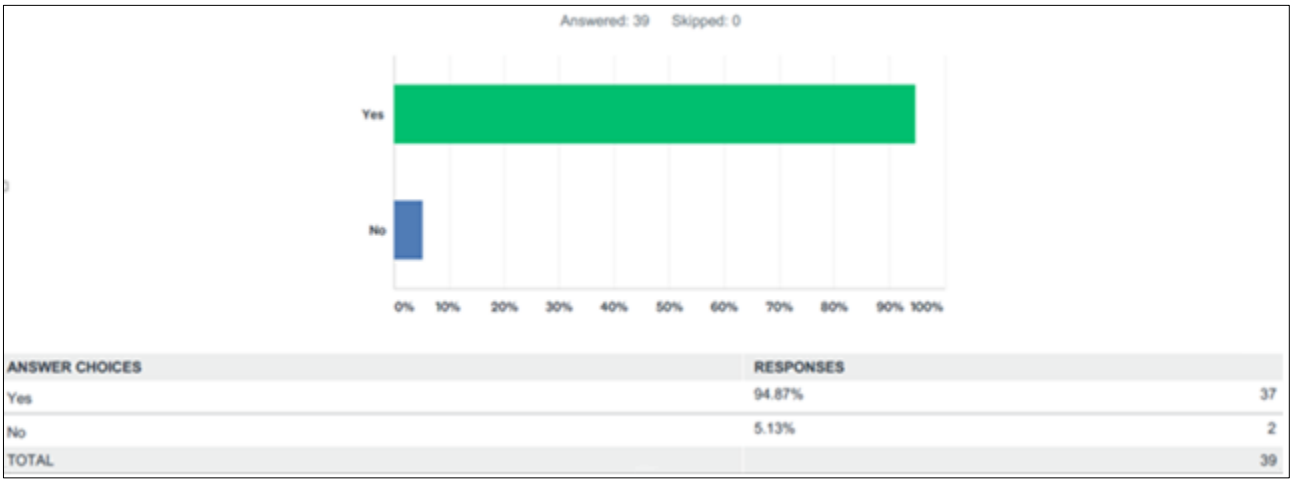


ANSWER CHOICES	RESPONSES	
No control	2.56%	1
Low level	23.08%	9
Intermediate level	46.15%	18
High level	30.77%	12
Total Respondents: 39		

Fig. 8. Countries' assessment on the level of control of biosecurity in relation to the use of antimicrobials

Q14. In your country, have the Veterinary Services and, where appropriate, Aquatic Animal Health Services, established collaboration with producers, stakeholders and relevant authorities to implement or improve biosecurity?

The response rate to the question was 100% and the majority of the respondents (94.87%) stated that collaboration had been established with producers, stakeholders and relevant authorities to implement or improve biosecurity.

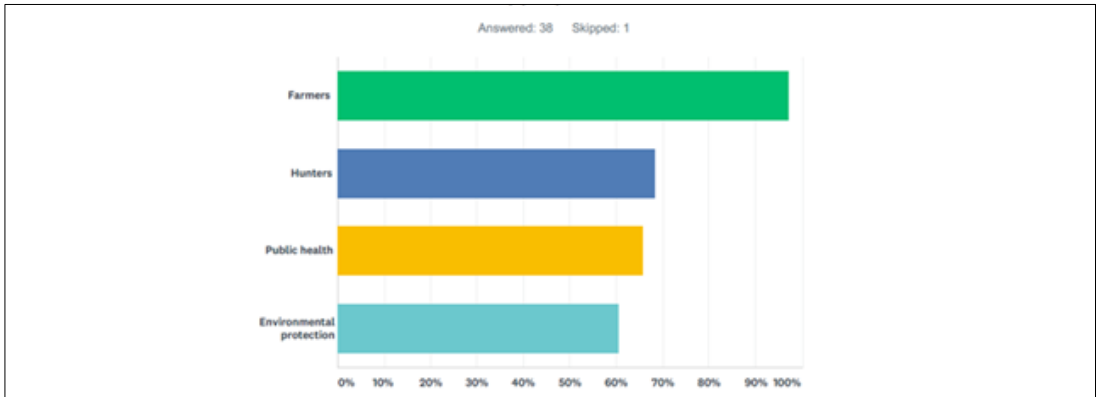


ANSWER CHOICES	RESPONSES	
Yes	94.87%	37
No	5.13%	2
TOTAL		39

Fig. 9. Countries in which cooperation has been established with the Authorities and the stakeholders involved in the implementation of biosecurity

Q15. If the reply to question 14 is yes, please indicate with whom collaboration has been established. Please tick the appropriate box or boxes.

The response rate to the question was 97.43%; one respondent skipped the question. Amongst the categories identified in the survey, farmers (cited by 97.37% of respondents) are the category with whom the highest frequency of collaboration has been established, followed by hunters (68.42%), public health (65.79%) and environmental protection (60.53%). Eighteen respondents (46.15%) indicated that collaboration has been established with all the categories listed in the question.



ANSWER CHOICES	RESPONSES	
Farmers	97.37%	37
Hunters	68.42%	26
Public health	65.79%	25
Environmental protection	60.53%	23
Total Respondents: 38		

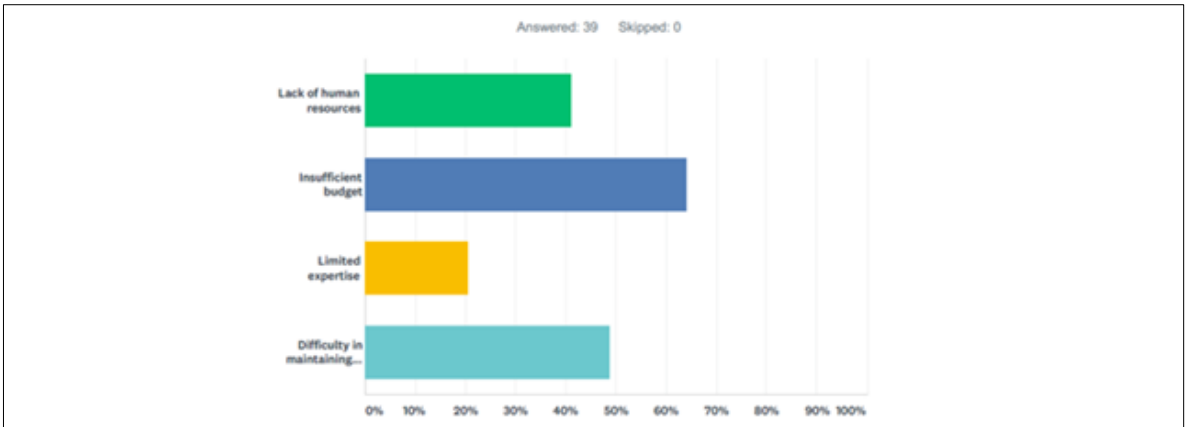
Fig. 10. Authorities and stakeholders with whom collaboration has been established for the implementation of biosecurity

Q16. In your country, which of the following adversely affect the ability of industry and the Veterinary Services to apply biosecurity? Please tick the appropriate box or boxes.

The response rate to the question was 100%. Insufficient budget was the factor indicated by the highest proportion of respondents (64.10%), followed by difficulty in maintaining biosecurity over time (48.72% of respondents), lack of human resources (41.03% of respondents) and limited expertise (20.51% of respondents).

The replies to this question most likely relate to the context of commercial holdings. Indeed, from previous research, it appears that in most rural sectors, personnel generally have a poor understanding of biosecurity. Furthermore, in the backyard sector, the main risk factors are human induced, such as illegal movements of infected pork meat and swill feeding together with suspected cases of underreporting and 'emergency sales'.

Knowledge deficiencies are one of the factors that need to be better understood and addressed to improve the effectiveness of control programmes.

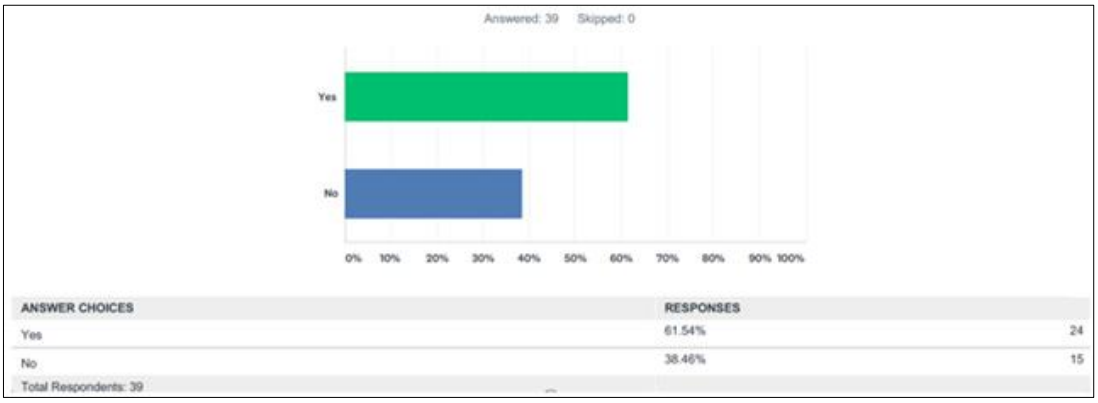


ANSWER CHOICES	RESPONSES	
Lack of human resources	41.03%	16
Insufficient budget	64.10%	25
Limited expertise	20.51%	8
Difficulty in maintaining biosecurity over time	48.72%	19
Total Respondents: 39		

Fig. 11. Factors adversely affecting the implementation of biosecurity

Q17. Would your country have an example of best practice in biosecurity to share?

The response rate to the question was 100% and 61.54 of the respondents replied that they have examples of biosecurity practices they would like to share.



ANSWER CHOICES	RESPONSES	
Yes	61.54%	24
No	38.46%	15
Total Respondents: 39		

Fig. 12. Countries having examples of best practice on biosecurity to share

The second part of the questionnaire included open questions whose aim was to identify strengths and weaknesses and collect best practices that could be of interest to all countries. In such context, some questions were developed to identify the aspects that are crucial for an effective implementation of biosecurity.

Q18. Concise description of the legal base in veterinary legislation for implementation of a biosecurity programme (BP) in production and trade of animals

The respondents reported on the existence of national legislation that establishes biosecurity requirements for farm animals in the food production chain, establishments and animal transport. The legal act may include sanctions in case of non-compliance. Some countries reported that biosecurity is only foreseen for holdings of a certain size or commercial holdings; other countries reported that requirements are graduated depending on the size of the holdings. Risk assessment was mentioned as a means to establish the level of risk of holdings, with any necessary mitigation measures then being applied based on the outcome of the assessment. Poultry and pigs are the production animals for which biosecurity measures are most frequently applied.

It was also reported that the Veterinary Authority establishes the general framework for biosecurity but other Ministries (Rural Affairs or Rural Development) can produce rules that are more specific. In some cases, it is the industry that establishes requirements that can also exceed the ones foreseen by the national legislation.

In general, the national veterinary legislation provides the legal basis for the implementation of secondary legislation regarding biosecurity measures. Some of the respondents pointed out that the central level imposes performance obligations and then officials are instructed to define the development of guidelines adapted to different types of production or targeted at specific diseases. Some respondents reported that it is the local competent authorities that approve biosecurity plans.

A country reported on the national legal basis for voluntary control programmes. In such cases, the competent authority approves the biosecurity plan with the requirements established by the industry, but it is the responsibility of the official veterinarians to supervise the farms included in the programme. Co-funding by the State is linked to the level of implementation of biosecurity.

Based on the answers received, the Veterinary Services may or may not be involved in funding the contents of biosecurity programmes.

With regard to biosecurity in aquatic animal production systems, a respondent indicated that a national Regulation provides the legal basis for the implementation of a biosecurity programme. Under this Regulation, all aquaculture production businesses, including farms, importers, dealers, processing establishments and transporters of live aquatic animals must be authorised, and specific authorisation conditions relating to biosecurity are applied. The Regulation also covers health, certification and transport requirements for the placing on the market of aquatic animals, aimed at preventing the introduction or spread of disease. In addition, this Regulation includes requirements for statutory disease control on suspicion or confirmation of a notifiable or emerging disease, including the application of movement restrictions, biosecurity measures relating to transport and equipment and any other additional measures necessary to prevent or limit the spread of the disease.

Based on the requirements of Article 3.1.2. of the *Terrestrial Animal Health Code*, the Veterinary Services should develop and document appropriate procedures and standards 'for prevention, control and notification' of diseases.

Q19. Explanation of a production system where a BP is implemented, with a brief description

Based on the results of the questionnaire, poultry and pigs are the production systems in which biosecurity programmes are most frequently implemented. This can most likely be explained by the recent epidemics of avian influenza and African swine fever and the economic impact of the diseases on these two production systems.

Some countries reported that they have biosecurity programmes for production animals with specific requirements for the different systems. Plans are developed taking into account the size of the holding, type of production system and risk factors. In other cases, biosecurity plans are targeted at specific diseases.

Some respondents mentioned that the indications to follow in the preparation of the plan are provided by the industry, while others stated that the National Research Institute, in collaboration with industry, produces biosecurity requirements following the indications reported in scientific publications (e.g. European Food Safety Authority [EFSA] opinions).

A country listed the measures established with the purpose of preventing disease spread, which include: 1) organisation of the movement of persons and means of transport; 2) prohibition of access to third parties to buildings and facilities where animals are kept (for foreigners: 48-hour waiting period); 3) quarantine of newly introduced animals; 4) separating sick animals from healthy ones; 5) proper handling of feeding stuffs, litter and other materials that may carry pathogens; 6) cleaning and disinfection; 7) rodent and insect control; and 8) confinement of domestic animals.

Minimum biosecurity requirements for domestic pigs have been established in the European Union (EU) with regard to African swine fever. The guideline summarises the ASF Strategy for the EU and was

developed and updated taking into account the latest findings from the EFSA. The guideline contains indications for the classification of domestic pig holdings, and the relevant biosecurity measures to be adopted in the different categories of holding (commercial, non-commercial, outdoor farms). It also contains indications for inspection, sampling and laboratory testing. The same document reports measures to be adopted in the affected area and in wildlife.

A country reported that a biosecurity programme is implemented in poultry production, establishing measures to reduce the risk of introduction of avian influenza viruses. High-risk regions and areas are identified based on certain risk factors (presence of avian influenza in wild species, confirmation of outbreaks in poultry farms, site of farms close to wintering areas or wet areas, areas with a high density of farms). In such areas, some activities such as breeding poultry in the open, using water from surface reservoirs to which wild birds may have access, poultry and other captive bird markets or concentrations, exhibitions among others, are banned.

The existence of rules and guidance on preventive measures to prevent the introduction of highly pathogenic avian influenza from wild birds to poultry or other birds kept in captivity was also mentioned. Different levels of biosecurity can be applied, based on a risk assessment carried out by the National Research Institute, but it is ultimately up to the Board of Agriculture to take a decision.

A country reported on the management procedures that should be part of an avian influenza plan, including the management of transport flows, management of incoming and outgoing flows (personnel, litter, animals, by-products, etc.), procedures for cleaning and disinfection and pest control procedures. The plan also requires protection measures against wild fauna and stipulates traceability requirements. For some species, these preventive measures should be supplemented with a screening programme before the animals are transferred to other farms.

In some countries, national programmes for avian influenza require that farmers are individually trained and that training is carried out at a national level.

When submitting the completed questionnaire, a country enclosed official guidelines concerning voluntary and preventive biosecurity measures implemented in primary production for the control of *Salmonella* and other relevant pathogens in poultry for meat production. This is a voluntary programme for the poultry meat sector, initially designed to prevent salmonellosis in poultry but later extended to become a more general biosecurity programme. The programme is mandatory for the members of the Poultry Meat Association and has the aim of improving poultry health and minimising the need for antibiotic treatments and the risk of infection between livestock facilities and humans. The programme is organised in different sections, which include general information to introduce the strategy of the plan, provisions for the approval of the establishment, procedures for the management of feed, water, litter, manure, staff and visitors. There are hygiene provisions and indications to sample for the detection of *Salmonella*. Additionally, special provisions related to hatchery rearing of breeding animals and breeding for egg production are provided. Each year, official veterinarians inspect the holdings that are part of the Poultry Meat Association programme.

The same country reported an example of legislation to be adopted to prevent transmission of infectious diseases from animals to humans. Animal holders are responsible for preventing the spread of zoonotic infection from their animals to humans. The legislation also includes the hygiene requirements to be adopted in facilities, for personnel, people visiting the holding, animals, pets and veterinarians. It is mandatory for both veterinarians and animal owners to minimise any spread of infection in dogs, horses and cats with clinical infections of methicillin-resistant *Staphylococcus aureus* (MRSA) or methicillin-resistant *Staphylococcus pseudintermedius* (MRSP). An animal that has a suspected or proven clinical MRSA or MRSP infection should be managed in a way that reduces the risk of spread of infection to other animals or to humans.

For the aquatic sector, a country reported the existence of an Aquatic Biosecurity Measures Plan (BMP) that is implemented in all authorised aquaculture production businesses and processing establishments. Under the conditions of their authorisation, they must have and operate in accordance with an approved BMP. The Official Service for Aquatic Animal Health provides templates and guidance and works with the site operator to produce an appropriate BMP for the business. On production of a satisfactory BMP, the Official Service will formally approve the plan; the establishment is then subject to official compliance audits under a statutory inspection programme delivered by the Official Service. As an example, the Fish Health Inspectorate (FHI) standard BMP template issued as guidance to the industry contains the

following sections: 1) Biosecurity manager; 2) Veterinary/fish health professional contacts; 3) Staff training – specify staff training and training record requirements; 4) Identify the risk of contracting and spreading diseases with animal movements; 5) Identify the risk of contracting and spreading disease because of site procedures; 6) Risk limitation measures implemented by the establishment – e.g. limited and health-checked sources of fish, benefits and limitations of health checks, disinfection of transport vehicles, measures relating to isolation of species with lower disease status, details of approved suppliers for imports; 7) Monitoring the plan – include the establishment's format for records to meet statutory requirements, stock inspections and actions in the event of disease or mortality; 8) Contingency planning.

Biosecurity is a tool that can be used at farm level to improve the performance (health status and production) of a holding but, in case of emergency, it is also a control option that forms part of a control strategy to be adopted in the affected area. In such cases, if the objective is disease control or eradication, it is necessary to define measures aimed at controlling the disease in the susceptible species and in the affected area. Minimum biosecurity requirements should be established for all holdings involved in commercial activities.

When preparing a biosecurity programme, the role of swill feeding in spreading disease must be considered and, when relevant, properly mitigated.

When a disease occurs in wild animals, mitigation measures should be considered to prevent the spread of the disease from wild to domestic animals.

Q20. Possible partnership between different stakeholders in implementation of a Biosecurity Plan

Countries have established partnerships with different stakeholders and, depending on the organisation of the central administration, with different Authorities and Ministries, including: Hunting Association and State Forests, Ministry for Internal Affairs, Veterinary School, Unions, Federal Ministry of Labour, Social Affairs, Health and Consumer Protection, the Ministry of Sustainability and Tourism, Police Force, Spiritual Directorate of Muslims, Farmer Associations, Hunters Associations, Ministry of Environment and Protection Entities, Norwegian Meat and Poultry Centre, Norwegian Agricultural Quality System, Ministry of Health, Ministry of Agriculture, Association: producers, breeders, for genetic improvements, private veterinarians, traders, slaughterhouses, National Parks, Wildlife Service and Birdwatch Associations. Partnerships with private companies for disinfection, disposal of dead animals and control of feed and water safety were also mentioned.

Q21. Evaluation of current level of implementation of a Biosecurity Plan

In the case where programmes are mandatory, it is up to the official veterinarians to check their implementation, in some instances with the support of a checklist and a scoring system.

The respondents reported that the inspection can be carried out with different aims: 1) to evaluate the level of biosecurity compliance of a holding; 2) to raise farmers' awareness of the importance of correctly applying biosecurity measures (reported for pig farms); 3) to obtain the certification required by certain certification schemes for a quality management system.

The respondents evaluated as satisfactory, medium or high, the level of implementation of biosecurity in their country. In general, the level of implementation is considered to be high for big commercial farms (pigs and poultry) but lower for small, non-commercial farms.

One country reported that farms with a lower level of biosecurity are included in a specific disease surveillance programme (CSF) and this should be considered as a good management practice. Indeed, farms with poor biosecurity in place are the ones in which diseases are more likely to be introduced and are the proper objective for 'targeted surveillance'

For voluntary programmes, it is most often industry that conducts biosecurity checks.

The animal owner is considered responsible for the implementation of biosecurity.

Q22. Additional activities and benefits arising from a BP (e.g. accreditation or certification of farms with an appropriate level of implementation of biosecurity measures, national subsidies for certified farms)

In general, the possibility of trading or selling animals on the internal market without restrictions or being part of a compartment are amongst the main benefits identified by the respondents.

As an example, it was reported that farms that fulfil certain requirements are registered in the Register of the Customs Union and in the Register of Enterprises of Third Countries, which allows export of products to the Customs Union and other countries outside the Eurasian Economic Union. Furthermore, ensuring biosecurity at a farm/establishment is a requirement for the allocation of government subsidies. The same also applies within the framework of cross-compliance.

A country mentioned the possibility of being part of specific 'food assurance scheme', so that members who meet certain requirements are able to sell their products at a better price. Sometimes, these producers can also benefit from reduced inspections based on the concept of 'earned recognition'.

For the aquatic sector, the implementation of biosecurity implies a reduction of the burden on industry through implementation of a risk-based disease surveillance programme; establishments with a biosecurity plan that meets the required conditions may benefit from a reduced statutory disease surveillance inspection programme.

Farmers whose livestock are included in voluntary biosecurity programmes are entitled to a higher level of compensation from the State as well as from insurance companies in the event of disease outbreaks (e.g. salmonellosis); furthermore, the higher the level of biosecurity they fulfil, the higher the level of compensation they will receive.

Some respondents mentioned that in territories placed under restrictions due to the presence of a disease, compliance with biosecurity is necessary to obtain certain derogations. As an example, birds kept in a zoo may be exempted from stamping out in case of effective biosecurity in place, or certain derogations to the ban of animal movements can be obtained only when certain mitigation measures (which include biosecurity) are applied.

Q23. Publicity activities, awareness raising of training programmes implemented as part of BP, with presentation of developed and distributed materials, reports of evaluation

Several activities have been conducted to raise awareness on biosecurity, including training for farmers, veterinarians and hunters. Additionally, to promote the application of correct biosecurity measures, leaflets, guidelines, brochures and posters have been used.

Other awareness activities, such as seminars, workshops, courses, publications in specialised magazines or on Web pages (INTERPORC, ANPROGAPOR and MAPA, etc.), have been used as an additional means to convey messages.

For the aquatic sector, the Fish Health Inspectorate (FHI) in the United Kingdom provides advice and guidance and produces BMP templates, which are made freely available to industry via the government website (www.gov.uk). The FHI engages with aquatic sector trade bodies on a regular basis.

AMCRA is the Centre of Expertise on Antimicrobial Consumption and Resistance in Animals in Belgium. The Centre has an advisory and awareness-raising role. Within the framework of awareness for farmers, a *Guide for farm health* has been produced and can be consulted on the AMCRA website (www.amcra.be).

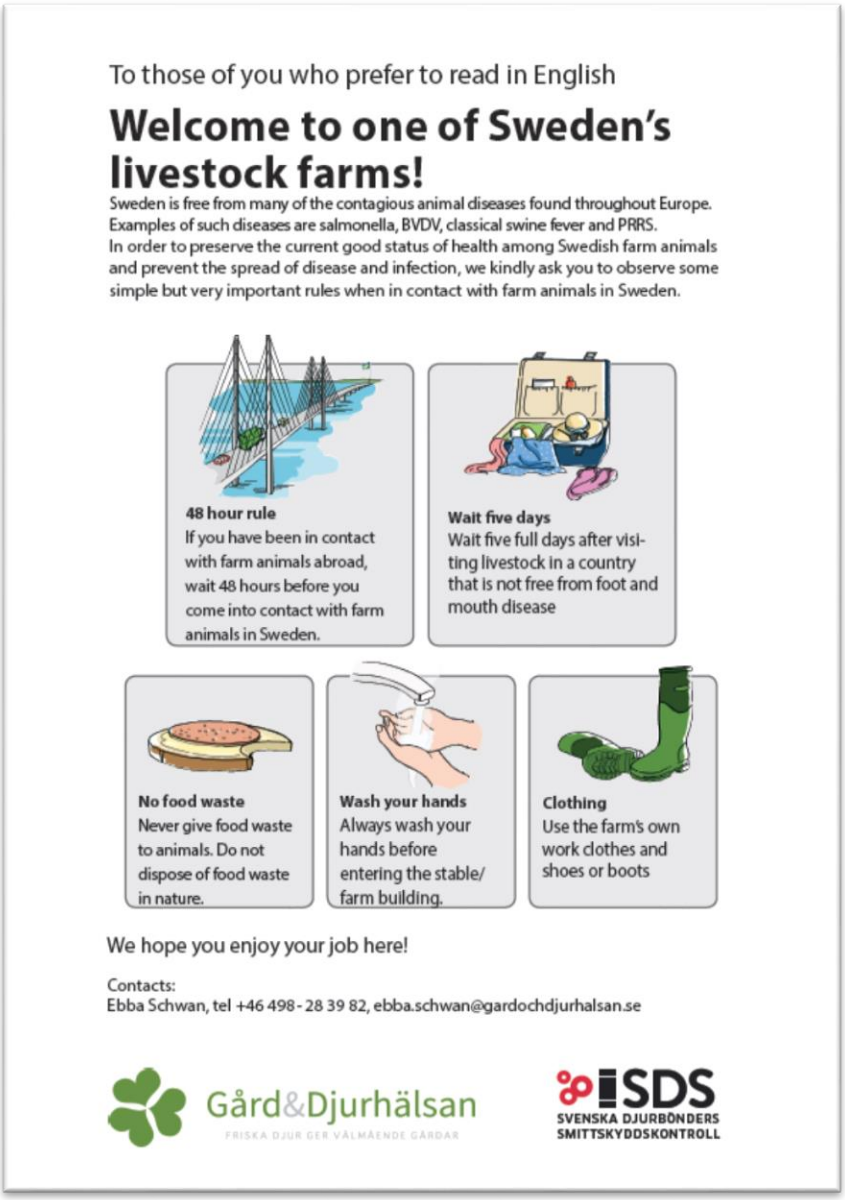


Fig. 13: Example of a leaflet to promote hygiene rules

Q24. Evaluation of implementation of a BP by the Competent Authorities (e.g. veterinary inspection services)

The Veterinary Services carry out official controls on farm biosecurity. Non-compliance is followed up with appropriate enforcement measures. In some countries, commercial farms are audited by a group of experts which, at the end of the assessment, delivers checklists and reports to the Central Veterinary Service for further action.

Some respondents reported that small backyard farms are evaluated by authorised veterinarians, who provide reports to the regional Veterinary services. In the event of non-conformity, backyards with pigs can also be inspected by official veterinarians.

In the case of wild animals, the Veterinary Services can carry out controls in cooperation with the Hunting Association.

Q25. New technology (software or applications etc.) developed in support to the evaluation or implementation of biosecurity

Ghent University of Veterinary Medicine (Belgium) has developed a scoring system (Biocheck.UGent) to assess the level of biosecurity of poultry and pig farms. This tool covers all relevant components of a biosecurity system. The unique feature of this scoring system is that it assesses the relative importance of the different biosecurity aspects and has as an output a risk-based weighted score. The scoring system is supported by a questionnaire that can be freely accessed and completed online. The resulting individual biosecurity score can be compared with national average values. The system also provides tailored advices on how biosecurity could be improved on the farm.

In Sweden, the industry has developed an IT program on the application of biosecurity and there are webpages with information on preventive measures for infectious diseases in farm animals. It is aimed at animal owners, animal caretakers or anyone who comes into contact with farm animals in their work. The web page has advice on disease prevention, detailed information on infectious diseases and how they may be spread, as well as a self-test to assess a farm's level of disease protection. The web page is run by the farmers' veterinary organisations in cooperation with the National Veterinary Institute and is financed by the Board of Agriculture.

For the aquatic sector, a web service has been developed to record movements of live aquatic animals in England and Wales. The system enables real-time recording and tracing of movements and is accessible both to industry and to the official service for aquatic animal health, namely the Fish Health Inspectorate (FHI). In addition, a bespoke inspection record app has been developed using tablet technology, which links to a central database used by the FHI and enables mobile Inspectors to undertake effective compliance audits and submit real-time inspection data. Among other things, the app makes available to the Inspector the current approved BMP for the authorised site as part of the unique inspection record, and triggers associated enforcement actions in the event of a non-compliance finding. Checklists for audits are now also available for Smartphone use.

Discussion

The survey on the application of biosecurity in the different production system was conceived as a questionnaire containing binary, multi choice responses, and descriptive answers. The answers collected provide relevant information on the subject that may be useful for other countries.

Key findings from the survey are as follows:

- The majority of the responding countries (94.87%) have a legal base for the implementation of biosecurity in their veterinary legislation and 92.31% of them have biosecurity plans that are enforced. However, only half of the respondents (53.85%) indicated that their country had national funds to support the implementation of biosecurity.
- 89.74% of the respondents have procedures in place to evaluate the implementation of biosecurity and the Veterinary Services are normally (94.59% of respondents) involved in inspecting the implementation of biosecurity plans.
- Some countries reported the existence of an independent Expert Group that checks the implementation of biosecurity and reports the outcome, including any non-compliance, to the Veterinary Authorities.
- Biosecurity plans mainly cover farmed animals: poultry and pigs are the production systems in which biosecurity plans are most frequently implemented. This is most likely linked to the recent epidemics of avian influenza and African swine fever in Europe.
- Biosecurity is normally targeted at commercial holdings. However, all holdings that have access to markets should be included in the biosecurity programme. Although non-commercial farms can be a dead end in terms of disease spreading, backyard units that sell animals at local or regional level can have a role in the spread of diseases.
- One of the respondents indicated that farmers are responsible for the implementation of biosecurity.
- A few countries reported their experience with biosecurity plans in aquatic animals and in these cases the level of implementation is quite high.

- Examples of biosecurity requirements and plans were reported for avian influenza, African swine fever, salmonellosis, tuberculosis and aquatic animal diseases.
- When preparing a biosecurity programme, the role of swill feeding in spreading disease must be considered and, when relevant, properly mitigated.
- Examples of a voluntary programme to prevent the infection with *Salmonella* and other diseases in poultry have been reported. The aim of such programme is to improve poultry health, minimise the need for antibiotic treatments and minimise the risk of infection between livestock facilities and humans.
- The respondents highlighted the preventive measures they considered relevant to prevent diseases spreading from wild to domestic animals. Other disease control tools, such as vaccination, disease surveillance and culling of wild animals, were suggested as a means of enabling early detect of diseases or to prevent diseases spreading.
- Biosecurity during hunting was pointed out as a useful way of avoiding the spread of diseases in wildlife and from wildlife to domestic animals. The removal and safe disposal of the remains of hunted animals was reported as an efficient measure to prevent the spread of diseases and to collect samples for testing.
- In line with the previous findings, farmers and hunters are the stakeholders with whom collaboration has most frequently been established to implement or improve biosecurity.
- Countries have established partnerships with different stakeholders, depending on the disease to be controlled and the organisation of the Central Administration.
- Many respondents highlighted the relevance of awareness campaigns and training in promoting the implementation of biosecurity.
- Some respondents reported of the existence of online information and teaching tools, mobile data collection and epidemiological decision support systems to facilitate the spread of information, training of professionals and the management of veterinary activities.

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