

APPENDIX 2: PROJECT HANDBOOK



NetPoulSafe

HANDBOOK OF SUPPORTING MEASURES

ACKNOWLEDGEMENT

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NETPOULSAFE is a H2020 project coordinated by ITAVI (Institut Technique de l'Aviculture), bringing together a group of 15 entities of 7 European countries, on the subject of biosecurity in poultry industry.

NETPOULSAFE project objective is to set-up a sustainable and multi-actor EU thematic network on supporting measures to improve biosecurity compliance in poultry farming. The project is designed to stimulate knowledge exchange between all relevant European stakeholders in order to collect, analyze, validate in practice if necessary, and widely disseminate effective supporting measures for the implementation and compliance of biosecurity knowledge and practices, for ensuring safe and viable poultry production.

Therefore, a self-sustainable network of the local poultry AKIS, representative of the local production systems, has to be set up.

The effective implementation of biosecurity practices in different European production systems at a local scale will be analyzed, in order to identify relevant, tailored and viable knowledge and best practices. The most effective supporting measures for ensuring and improving biosecurity compliance will be analyzed and selected in each country. The most promising ones will be tested in pilot farms to provide evidence of their impact in different species, production types or conditions.

The best supporting measures tailored to stakeholders will be gathered on a knowledge platform and widely and efficiently disseminated for ensuring biosecurity practices acceptance, ownership and compliance.

More information on the project can be found at: <http://www.netpoulsafe.eu>



INDEX

1 INTRODUCTION OF THE HANDBOOK	7
1.1 Importance of biosecurity in the poultry production chain	7
1.2 Creating a culture of biosecurity	8
1.3 Netpoulsafe project: objectives	9
2 NETPOULSAFE HANDBOOK	10
2.1 Objective	10
2.2 Structure and how to use it	10
2.3 How and why were these first SM chosen?	13
3 SUPPORTING MEASURES FOR FARMERS	16
3.1 Practical sheets to help farmers manage biosecurity risks on their farms	16
3.2 Education and training of the farmers	18
3.3 Staff veterinary control, special biosecurity checklist development	19
3.4 Biosecurity regulation for Italian poultry production	22
3.5 Italian checklist for biosecurity	25
3.6 Biosecurity checks (by stakeholders) focus on the integrated companies	28
3.7 Online farm health team meeting using paint 3D and google maps to improve farm zoning	31
3.8 Training for farmers on how to prepare the workspace for the veterinarian on the farm	34
3.9 Can the integrated company be a supporting measure?	36
3.10 Costs related to an avian influenza (HPAI) positive farm in Spain	38
3.11 Related costs in a salmonella-positive herd in Spain	41
3.12 Water quality control by belplume quality label	45
4 SUPPORTING MEASURES FOR ADVISORS	48
4.1 Objectively measuring the biosecurity status through the Biocheck. Ugent scoring tool	48
4.2 Coaching farmers towards improved biosecurity	51
4.3 Training of poultry farmers on biosecurity	54
4.4 Participatory approach to better support poultry farmers in biosecurity	57
4.5 Biosecurity audit with the PULSE tool	60
4.6 Regulation set up supporting biosecurity implementation preparation of professional proposals ...	63
4.7 Get to know yourself and your advisors for good collaboration	65
4.8 Improve biosecurity with your multi-actor farm health team	68
4.9 Practical tool to assess the effectiveness of farm sanitary barrier	71
4.10 BIOPON programme	74
4.11 Theoretical/practical courses on biosecurity for farmers	78
4.12 On-site assistance farm veterinarian.....	81

4.13 Individual coaching for the specific difficulties of direct selling farms	83
4.14 Using videos for dissemination of information to visitors or farmers	86
4.15 training/workshop for poultry workers during coaching	89
5 SUPPORTING MEASURES FOR FARMERS AND ADVISORS	93
5.1 Coaching experiences in italy: how do you do in an integrated poultry production system	93
5.2 Virtual farm tour as an alternative to physical farm tour	96
5.3 Live workshops as a supporting measure for the implementation of farm biosecurity	99
5.4 Postcard for hobby poultry farmers in times of avian influenza	101
6 FACTSHEETS EXPLAINING HOW TO CORRECTLY IMPLEMENT SUCCESSFUL BIOSECURITY MEASURES FOR FARMERS	102
6.1 Biosecurity for catching/vaccination crews	102
6.2 Water management and sanitation -sampling strategies	105
6.3 Ways to reduce the risks associated with vehicles visiting the farm	108
6.4 Preventing cross-contamination in multi-species livestock farms	111
6.5 Tips for a better use of the hygiene lock	113
6.6 how to safely store disinfectants on a poultry farm?	116
6.7 create your farm-specific hygiene protocol	118
6.8 how to encourage good behaviour in your hygiene lock	121
7 FACTSHEETS EXPLAINING HOW TO CORRECTLY IMPLEMENT SUCCESSFUL BIOSECURITY MEASURES FOR ADVISORS	123
7.1 Interactive registers of disinfection and use of disinfectants, transport vehicles entering the farm, entrances to poultry houses, and daily inspections of the poultry flock	123
7.2 Feed mill biosecurity guide	125
8 FACTSHEETS EXPLAINING HOW TO CORRECTLY IMPLEMENT SUCCESSFUL BIOSECURITY MEASURES FOR ADVISORS AND FARMERS	128
8.1 Checking the effectiveness of cleaning and disinfection in poultry houses	128
8.2 Improving biosecurity in anterooms using fluorescent substances	132
8.3 Basic hygiene measures against avian influenza infections	134
8.4 The importance of checking the efficacy of cleaning and disinfection	136
8.5 The importance of external and internal biosecurity	138
8.6 The principles of proper farm cleaning and disinfection program	141
8.7 Principles of biosecurity for hunters	144
8.8 Protocol for egg collection	146
8.9 Development of biosecurity instructions regarding organizational and equipment requirements dedicated to vaccinations on a poultry farm	149
9 CONCLUSION	151

1 Introduction of the handbook

1.1 Importance of biosecurity in the poultry production chain

Recent outbreaks of highly pathogenic avian influenza (HPAI) have highlighted the sensitivity of the European poultry sector to epidemics: as the epidemic can spread very quickly and severely through different countries in Europe, hitting down all the poultry sector, improving biosecurity compliance in animal production systems can be considered as a major lever to reduce the risk of disease introduction or pathogens spreading.

“Biosecurity refers to a set of management and physical measures designed to reduce the risk of introduction, establishment and spread of animal diseases, infections or infestations, from and within an animal production (OIE, Terrestrial Animal Health Code, 2019).”

The control of foodborne pathogens like *Salmonella* and *Campylobacter* has become a public health issue and control programs have been set up, but biosecurity remains a pillar of the fight against these pathogens.

At the farm level, avoiding the introduction of pathogens allows to grow healthier animals, result in better animal welfare, better sustainability of livestock systems and less antibiotic use, which helps to fight against antibiotic resistance.

Two main pillars help to prevent diseases in farm:

- Proper management, welfare, and immunisation of the poultry:

In properly vaccinated animals and in animals reared with minimised stress level, their immune system is more prepared to deal with pathogenic microorganisms that may infect them.

- Adequate biosecurity throughout the poultry production chain:

While it is very important that animals have a strong immune system, it is even more important to prevent pathogenic micro-organisms from infecting them. The implementation of proper biosecurity measures not only in poultry farms, but also in the whole poultry production chain (comprehensive of vehicles, hatcheries, slaughterhouses, feed mills, ...) is key to minimise the transmission of poultry diseases. **What are the biosecurity measures?** Some of the most important ones are reported below:

- **Maximum restriction at the entrance of the farm for vehicles and entry always after disinfection of at least the wheels** (paying special attention to vehicles shared with other farms).
- **Maximum restriction of visitors** (and only essential visitors as veterinarians, maintenance staff...) **wearing of house specific clothing and footwear and hand disinfection** (paying special attention to personnel working on other farms such as catching crew) **though a hygiene lock.**

- **Correct demarcation of the dirty and clean** areas of the farm and of each house.
- **Proper drinking water and feed hygiene** (feed storage protection and drinking water analysis end line each year).
- **Proper biological vectors control** (rodents control, wild bird control and no domestic animal such as dogs and cats in the professional area)
- **No backyard poultry on the site**
- **Proper management of dead animals** (removal of the carcasses at least twice a day, closed rendering tank located outside of the secured area and cleaning and disinfection of the rendering tank after each collection)
- **Manure stored in a specific isolated area outside of the secured professional area** (or if no secured area: away from the house)
- **Concrete surrounds around the house**
- **Recognizable separate material only for the poultry house**
- **Protection of the litter** (in a closed shed or other protection, from birds or vermin ...)
- **Proper cleaning and disinfection of the facilities, drinking system, feed silo between flocks and bacterial autocontrol of the cleaning and disinfection of the house between each flock.**

Considering these aspects, the correct implementation of biosecurity measures may be beneficial for many different aspects, such as: the likelihood reduction of poultry becoming infected with pathogenic micro-organisms, minimising economic losses due to mortality or low productive performance, mitigating negative repercussions at public health level, reducing the excretion of zoonotic microorganisms of importance in food safety and the spread of bacteria resistant to antibiotics.

1.2 Creating a culture of biosecurity

In order to make all these biosecurity measures effective, a culture of biosecurity should be established not only among the farmers and other owners or operators of slaughterhouses, hatcheries, feed mills, feed mills, etc., but also in every single person working in the poultry production chain (farm workers, catching crews, vaccination and cleaning and disinfection teams, pest control personnel, transporters, etc.).

And what does this culture consist of? It is about getting all these people to comply with and correctly apply the biosecurity measures implemented as an acquired habit, without effort, and to do it every day.

Here we have a necessary ally: the fundamental tool to achieve this goal are the different supporting measures such as audits, trainings that raise awareness on the importance of biosecurity. All personnel involved in the poultry production chain must know why biosecurity measures are applied and what are the possible consequences of not doing it correctly. In other words, a farm worker, for example, may be more motivated to step on the footbath

and not skip it if he knows that he can remove the HPAI virus attached to his footwear and thus prevent the consequences.

In order to transfer this knowledge to the personnel involved in the poultry production chain, it is necessary to implement effective supporting measures for both farmers/workers and advisors to help spread this culture to improve biosecurity compliance in the poultry industry and keep it live on a permanent basis, which is a real challenge. To tackle this challenge, Inspiration can be found in some other countries, who may have some innovative and effective ways to supports farmers to improve biosecurity compliance.

1.3 Netpoulsafe project: objectives.

The main objective of the project is to **create a European network to exchange knowledge and practices about biosecurity and supporting measures to improve biosecurity compliance between poultry actors.**

This network will involve all poultry chain from hatchery to slaughterhouse, for different types of productions and species including farmers and vets of broilers (indoor and free-range), turkeys, breeders, laying hens (indoor and free-range) and ducks productions, transporters of animals, poultry production organizations including farm technicians, slaughterhouses, feed manufacturers, integrators companies, advisors, inter-branch organisations, and policymakers) in order to:

-Collect biosecurity practices and the reasons why they are well (or not well applied) on the field.

-Collect, analyse, and select the most effective **supporting measures** for ensuring biosecurity compliance. that are used in the main European countries involved in meat and egg poultry production

-Validate a set of key supporting measures on **pilot farms** in different countries, for different species and production systems, to provide evidence of their impacts. **Live or virtual coaching, participative approach and group discussions, virtual farm tours, live workshops, biosecurity trainings and use of educational modules** will be validated.

-Share the results to farmers, advisers, and the poultry sector, through educational material: **Factsheets, videos, podcasts, e-learning modules**, explaining what supporting measures are the most effective or interest, what the benefits of the farmers are, and how these supporting measures can be implemented in practice. These materials will be accessible on the website of the project and will be **disseminated** through **workshops, trainings, and others educational events.**

2 Netpoulsafe Handbook

2.1 Objective

The aim of this handbook is to compile in one document **50 of the most successful supporting measures (that will be described in 50 factsheets)** for both farmers and advisors (including veterinarians) in the 7 countries participating in the project.

What are supporting measures? They are different tools available to farmers and advisors to help improve biosecurity compliance. Different types of courses and trainings, audits, legislation etc. are some of the supporting measures that have been compiled in this handbook. Each of the supporting measures is presented in the format of factsheets. These factsheets focus on describing in a visual, practical, and easy to understand way how the supporting measures are implemented.

This handbook contains **50 supporting measures** obtained from results of the project. These are the supporting measures that are successful in each of the countries participating in the project and o that have become successful in their country after the validation process on pilot farms during the project. Some of these 50 SM describe how to correctly implement important biosecurity measures, so the text itself acts as an SM.

2.2 Structure and how to use it

The technical content of this handbook is divided into **six parts**: the first (chapter 3) of which contains **supporting measures for farmers**, the second one (chapter 4) contains **supporting measures for advisors (including veterinarians)** and the third one (chapter 5) **supporting measures for farmers and advisors**. Part 4 (chapter 6), 5 (chapter 7) and 6 (chapter 8) contains **factsheets explaining how to correctly implement successful biosecurity measures (text itself acts as an SM) for farmers, advisors (including veterinarians) and famers and advisors** respectively. Since some SMs are described in such a way that farmers can directly apply these SMs without the need for an advisor, while others require advisors to be trained before they can be implemented on the farm. Therefore, depending on the type of professional reading the handbook, you should go to the section that applies to you.



Many of the supporting measures whose target is veterinarians describe supporting measures that the ultimate beneficiaries are the farmers. That is, a supporting measure may describe how to conduct a coaching session, explaining to advisors how to be a good coach. But these sessions also involve the farmers actively and the ultimate aim is to improve the biosecurity of their farm, so it is a supporting measure that is useful for farmers as well.

Within each factsheet (which describes a supporting measure), there is a table as follows:









The **left column** represents the **target** of the factsheet, who are either farmers or advisors, including veterinarians.

Below is the meaning of the following icons:





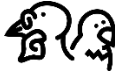







	Farmers
	Advisors (including vets)

The **middle column** corresponds to the **type of species/production type targeted by the specific supporting measure described in the factsheet**. Since these are supporting measures that are successful in a given country, it is possible that they are only implemented in certain species or production type due to various circumstances, but that they may well be useful in other species or production types.

Below is the meaning of the following icons:

	Broiler indoor
	Free range broiler
	Indoor and free range broiler
	Chicken breeders
	Laying hens indoor
	Free-range laying hens



	Indoor and free-range laying hens
	Indoor Turkey
	Free range turkey
	Indoor and free range turkey
	Turkey breeders
	Indoor ducks
	Free range ducks
	Indoor and free range ducks
	Duck breeders
	All species indoor
	All species free range
	All species indoor and free range

The **right-hand column** indicates **the country in which the supporting measure is already being used successfully**. Some of the supporting measures that are successful in one country may also be successful in another country. In the case of supporting measures whose tools are only available in the native language of the country, this can also be useful as it can be an inspiration for the development of such tools in another country.

In addition, for some of these supporting measures, different **audio-visual materials** such as videos and podcasts have been produced to provide further information about them and make them even easier to understand. The links to these materials are indicated at the bottom of each SM in the handbook.

2.3 How and why were SM chosen?

As mentioned above, the handbook presents **50 supporting measures that have been successfully implemented before or after a validation process on pilot farms in the different project countries**.

How have they been detected? During the first year of the project, different types of questionnaires were developed for farmers and advisors of broilers (indoor and free-range), turkeys, breeders, laying hens (indoor and free-range) and ducks productions. In addition, questionnaires were developed for slaughterhouses, feed suppliers, egg collection facilities and hatcheries. A total of **406** questionnaires (in the 7 countries) were collected, providing previous information about which biosecurity measures are implemented and which are not, and for the latter, the reasons why they are not implemented. In addition, information was also collected on **which supporting measures work successfully** and which ones need to be implemented. Below are the list each of the supporting measures that were included in the questionnaires as options to answer and other SM that were detected by the NFs after the questionnaires were carried out:

-Biosecurity trainings: exposure visit at well-organized farm/field trip, group discussion (also between farmers of the same integration), live workshops, videos, webinars and educational modules.

Whether face-to-face (also on site at farm practical) or online, individually or in groups, different types of biosecurity training are important as they raise farmers' awareness of risk factors and how they can mitigate them by implementing the correct biosecurity measures. Not only for the farmers but for all the workers and on a continuous basis and by holding meetings between all the farm staff. Also training for the people who carry out training.

-Conducting information campaigns promoting biosecurity: conferences/webinars farmer meeting, Leaflets/banners/posters, media (TV and web: Youtube etc), social media groups (WhatsApp groups, Facebook, LinkedIn, etc) and Gadgets: (lines, pencils, key rings, cups, bags etc.).

Communication campaigns through different channels and events are important as they give visibility to the importance of complying with biosecurity measures.

-Educational material: Books/guides/manuals/ research papers/journals/ farming press, Posters/banners/newsletters /leaflets, Media: TV and web (YouTube etc.), social media groups (Facebook, LinkedIn, etc)

The different educational materials are a good tool for both farmers and advisors as they describe in an adequate way how to properly implement the different biosecurity measures. In addition, they can be consulted as often as you want.

-Biosecurity checks (audits) : by government, by stakeholders (local integration companies and audits from third parties (clients, quality assurance institutions, GDO)

A great help for farmers is to help detect risk factors associated with the entry of pathogens specific to their farm through on-site audits.

-Regulations set up supporting biosecurity implementation (not only legislative, also Internal standard procedures of the integrated company).

Each country has mandatory biosecurity measures and the regulations that include them are a tool to help meet these requirements. Also integrated farms have internal standards that must be met in order to belong to the company even if they are not required by law.

-Support by a biosecurity advisor (coach /vets) : Contact support (farm/company visiting), distance support (by phone, email, Facebook etc.) advisor coaching methods.

The specialised advice for each farmer is very useful as it seeks to solve specific problems of each farm, either directly through advice or through coaching.

Organisation of competition for best biosecurity (eg “biosecurity award”)

Holding an inter-farm competition to reward the best in biosecurity can be an incentive to improve farms.

Financial support for biosecurity implementation

Helping farmers financially is necessary because often what prevents them from improving their farms is the money needed to do so.

Other Supporting measures: Economic incentive useful for improving the compliance of biosecurity and penalties for non compliant farmers (no new contracts)

Based on the majority of responses in the different questionnaires in each country, each NF determined the supporting measures that have already been implemented and work successfully in their country, choosing the most important ones to describe them in Factsheets format. Explaining how these SMs are implemented, choosing the target in order to show in a simple and visual way how they work and what are the advantages of applying these supporting measures to improve biosecurity compliance. Also as mentioned, the NFs in each country analysed which supporting measures had not yet been implemented and had




been reported as necessary in the surveys and some of them were tested on a number of pilot farms in a validation process that took place between mid-2022 and mid-2023. And finally, both in the surveys and during the validation process of the required SM, the different NFs have been collecting the needs of the different farmers and advisors to explain in a simple way, some biosecurity measures.

In the introduction of the handbook, the importance of biosecurity throughout the poultry production chain was explained, as well as the need to create a culture of biosecurity in all people working in the poultry industry. The main objectives of the Netpoulsafe project were also highlighted and it was explained how to use this handbook correctly. In this handbook, you will find 50 SM in factsheet format that will help you to improve the biosecurity compliance of your farm or the farms of the farmers you advise.

3 Supporting measures for farmers

3.1 Practical sheets to help farmers manage biosecurity risks on their farms.



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PRACTICAL SHEETS TO HELP FARMERS MANAGE BIOSECURITY RISK ON THEIR FARMS







MAIN KEY POINTS

- It is often difficult for the farmers to understand how to implement biosecurity regulations in their farms.
- ITAVI has translated French regulation for all specific cases into practical factsheets explaining with “simple words” how to implement biosecurity rules in the farms according to the different production systems and their specificities. The factsheets are [available here \(in French\)](#)

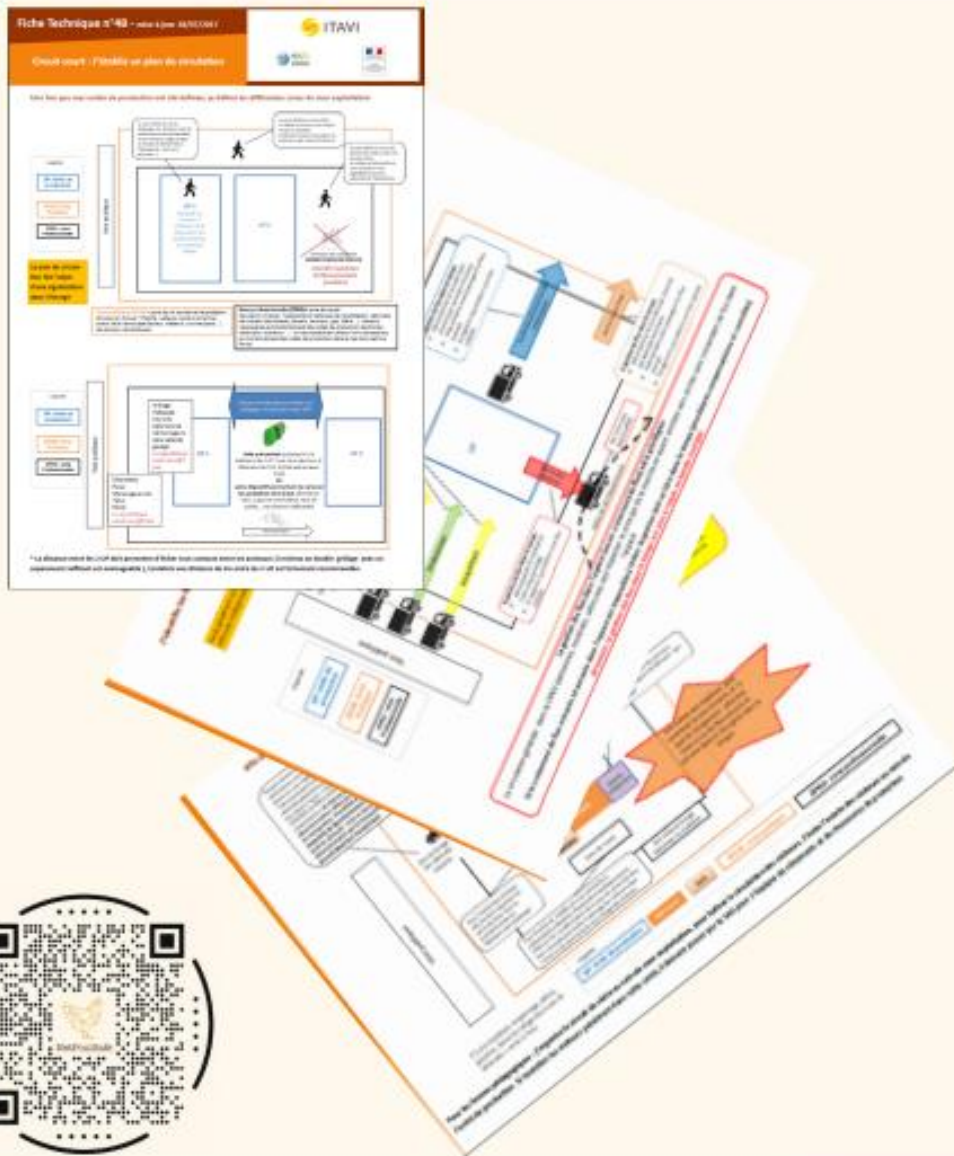
Practical factsheets, to help the farmers to write their own biosecurity plan

The French regulations on biosecurity were set in reaction to first French avian influenza outbreaks. They require each poultry farmer to **write his own biosecurity plan** based on a risk analysis, taking into account his organisation, the farm environment and the day-to-day practices.

To help farmers writing their plan, **some educational sheets**, in addition to other support (training, existing specifications, advice from veterinarians and technicians), were created to explain how the regulations can be adapted to specific situations (very small farms with several productions, direct selling etc..), identifying related risks, and providing recommendations.




PRACTICAL SHEETS TO HELP FARMERS MANAGE BIOSECURITY RISK ON THEIR FARMS



For more information:

[Download the files \(in French\)](#)




This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).




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Links: [Download the files \(in French\)](#)


3.2 Education and training of the farmers



EDUCATION AND TRAINING OF THE FARMERS








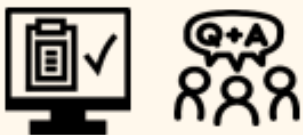
MAIN KEY POINTS:

- The importance of education in biosecurity
- What is biosecurity? Improper and correct biosecurity practices
- What can we do, how can we improve?

From 2022, the University of Veterinary Medicine Budapest (UVMB) is launching a complex training course on biosecurity for farmers, farm managers and sector leaders.



**Hybrid form:
personal and online
training**



Professional materials, training videos:

- Concept of biosecurity, improper and correct practices
- Transmission of infectious diseases
- Personal and farm hygiene
- Cleaning and disinfection

Questionnaires, online exercises – before and after the training



- How is biosecurity in your own farm?
- Things to change, what can you do, how to improve?

Farmvisit: one day farmvisit practical – check everything, what we learned

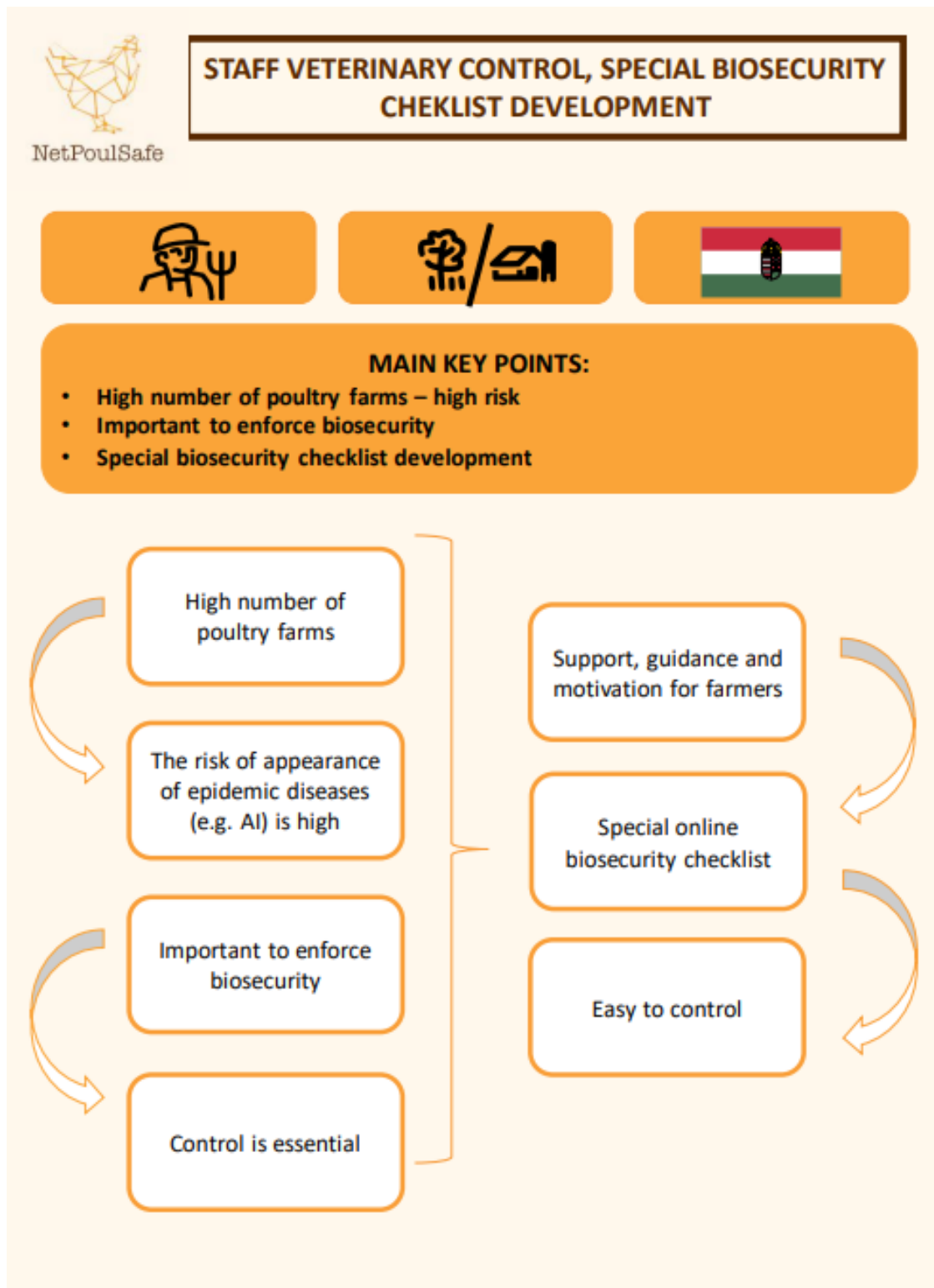
For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>

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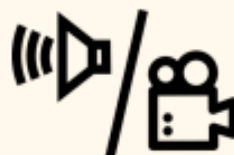



3.3 Staff veterinary control, special biosecurity checklist development.

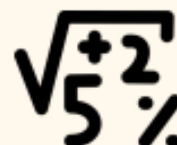


STAFF VETERINARY CONTROL, SPECIAL BIOSECURITY CHECKLIST DEVELOPMENT**Special biosecurity checklist**

- National Food Chain Safety Office (in Hungarian NÉBIH), Hungarian Poultry Product Council
 - + UVMB – professional tasks, development
- **Goals:** give support, guidance for farmers to build a coherent, well-controlled biosecurity
- **Motivation:** financial compensation depends on the results

How it works?

- **47 questions about:**
 - Structure of the farm, biosecurity, hygiene, workers, rules, veterinary control, preventive measures etc.
- **Attached pictures, scanned documents**
 - Pictures taken with a smartphone app – GPS coordinate on it → no chance to cheat!
 - About: changing rooms, clothes and equipments, disinfectants, feeding / drinking system, feed and litter storage, rodent control, biosecurity plan, result of hygiene samples etc.

STAFF VETERINARY CONTROL, SPECIAL BIOSECURITY CHEKLIST DEVELOPMENT**How to control?**

- Verification by an advisor
 - Online with videochat
 - Personal farmvisit
- Every question is scored
- Total 226 score
 - >185 – excellent
 - 146-185 – very good
 - 114-145 – good
 - <114 – did not comply
- The advisor issues a certificate of the results (valid for 1 year)
- Normally: 60% financial compensation (e.g. in case of AI)
- If the result is good, or very good: +25%
- If the result is excellent: +30%

Consequences?

- **Motivated, supported farmers**
- **Well-controlled biosecurity**
- **Better and safer production**

For more information:


- NETPOULSAFE project : <https://www.netpoulsafe.eu>

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3.4 Biosecurity regulation for Italian poultry production.




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BIOSECURITY REGULATION FOR ITALIAN POULTRY PRODUCTION







MAIN KEY POINTS

- Importance of regulation on biosecurity in poultry
- Focus on specific regulation per specie per region
- Suggestions for farmers


In Italy, a national biosecurity legislation is in force that is valid for all the poultry species. Ministerial Ordinance on Biosecurity (O.M. 26 August 2005), more info [here](#).

But how did we get there?

No biosecurity regulation in force

1999-2004
Recurrent Avian Influenza outbreaks

2005-2021
Ministerial Order on Biosecurity continuously amended



2005
First version of the Ministerial Order on Biosecurity

2021
Latest version of the Ministerial Order on Biosecurity

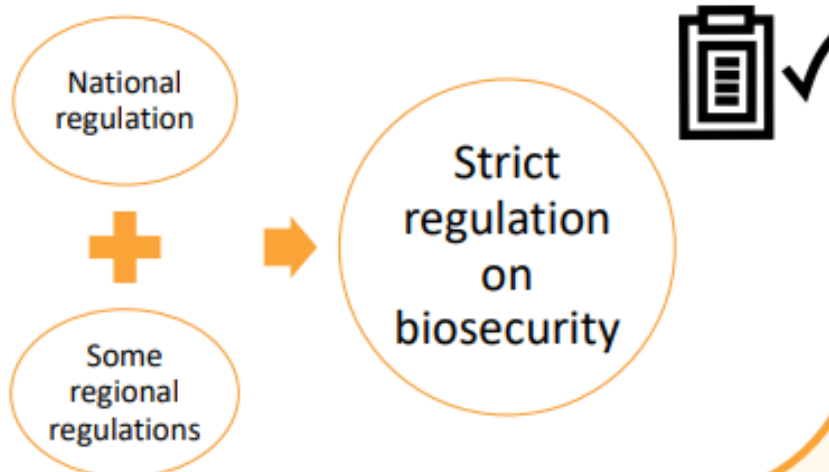
BIOSECURITY REGULATION FOR ITALIAN POULTRY PRODUCTION

Despite a national regulation (O.M. 26 August 2005 and successive amendments)



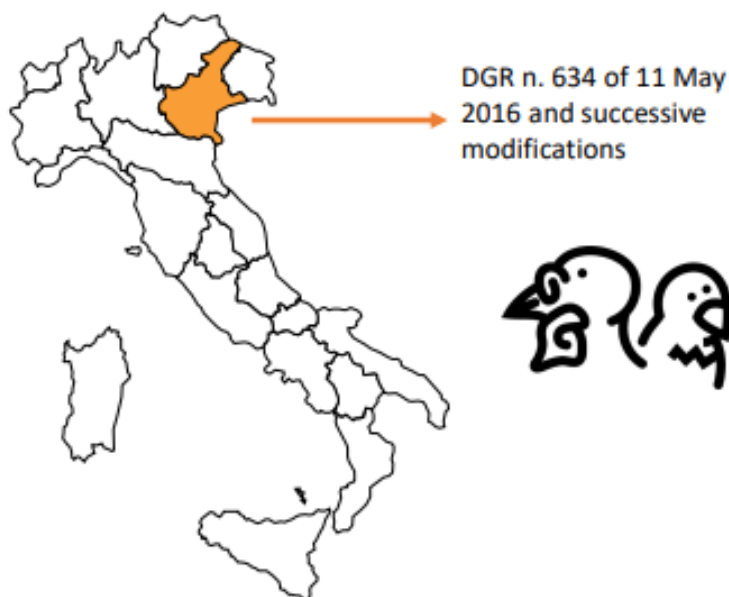
some regions can have an additional and specific regulation

So, biosecurity in Italian poultry farms is strictly regulated



BIOSECURITY REGULATION FOR ITALIAN POULTRY PRODUCTION

It is the case, for example, of Veneto region that has established a specific legislation for turkeys



Having specific legislation allows to have rules to follow which, if respected, are an advantage for all the operators of the poultry sector, first of all farmers

Therefore, given the presence of specific legislation on biosecurity, it is suggested that farmers:

- **read** carefully the legislation!
- **keep informed!**
- **rely on** the opinion of the official veterinarian!

For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>



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Links: Ministerial Ordinance on Biosecurity (O.M. 26 August 2005), more info [here](#).

ITALIAN CHECKLIST FOR BIOSECURITY

The official veterinarians carry out **periodic inspections** on the farms. After the selection of the farm, the visit is planned with the farmer.

The visit occurs following a **specific procedure**. The main points are:

Arrival at the farm (empty, when possible)



Visual check of the entire farm

Visit around the entire farm

Start noting any deficiency

Each house must be checked inside



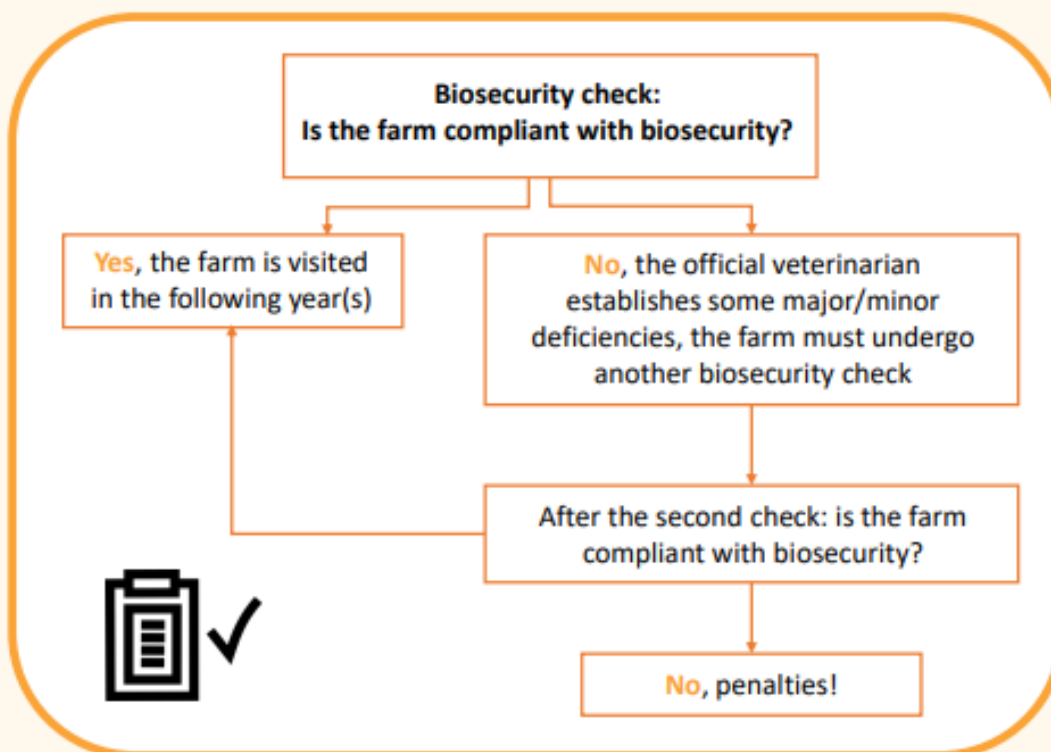
Cleaning and disinfection procedures are evaluated

Check of the house floor in the empty farm

ITALIAN CHECKLIST FOR BIOSECURITY

Click here to have a deeper look (*link at the video*)!

What is the biosecurity check flow?



Therefore, it is suggested that farmers, following the visit to the farm by the official veterinarian:

- be **honest!**
- be **collaborative!**
- **rely on** the opinion of the official veterinarian!

For more information:


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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).




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3.6 Biosecurity checks (by stakeholders) focus on the integrated companies.



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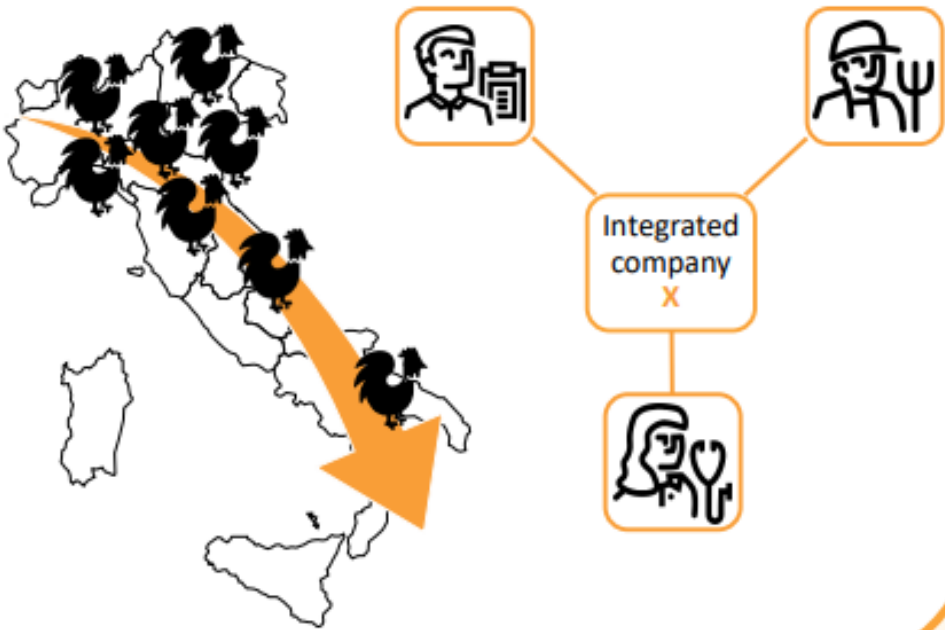
BIOSECURITY CHECKS (BY STAKEHOLDERS) FOCUS ON THE INTEGRATED COMPANIES



MAIN KEY POINTS

- Assessment of biosecurity measures in poultry farms
- On-farm biosecurity inspection by integrated companies
- Use of specific integrated company policies

Italian poultry production is organized into **vertically integrated chains**, *i.e.*, companies that control each step of the production cycle (from the hatchery to the slaughterhouse, including feed mills and personnel working on field)

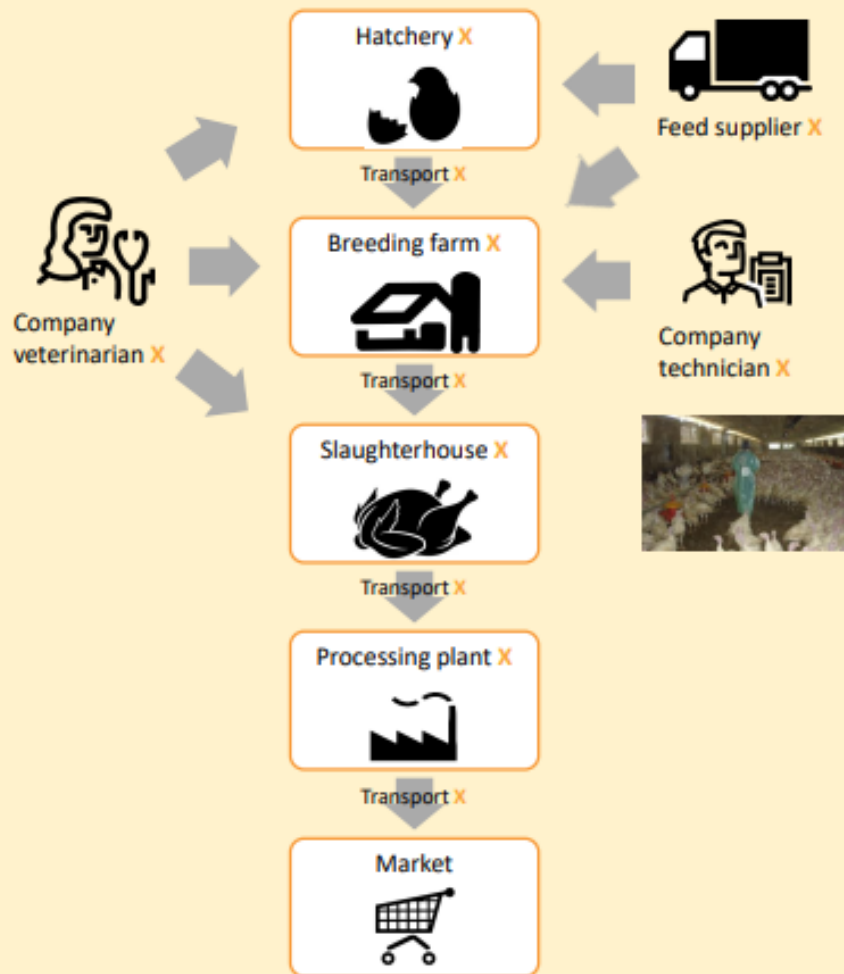


```
graph TD; A[Person with clipboard] --- B[Integrated company X]; B --- C[Farmer with pitchfork]; B --- D[Person with stethoscope];
```


BIOSECURITY CHECKS (BY STAKEHOLDERS). FOCUS ON THE INTEGRATED COMPANIES

How integrated companies are organised?

Integrated company X organization



- The **integrated company** provides: birds, feed, support (human resources), transport, processing facilities
- The **farmer** provides: facilities, labour, utilities

BIOSECURITY CHECKS (BY STAKEHOLDERS). FOCUS ON THE INTEGRATED COMPANIES

In this context, after the farmer the two main actors are the company **technician** and/or **veterinarian**, who **periodically visit the farm** to monitor the regular performance of the activities



Veterinarian

- Visits farms less frequently
- Intervenes in case of flock problems
- Decides intervention measures



Technician

- Visits farms more frequently
- Checks flock performances
- Provides support to the farmer

Integrated companies have their own policies on biosecurity measures: farm veterinarians and/or technicians evaluate **biosecurity measures** by using **company checklists**. If during the visit non-compliance in biosecurity is detected, they provide indications on possible corrective actions.

Therefore, it is suggested that farmers, following the visit of technicians and veterinarians belonging to the integrated company:

- be **as transparent as possible!**
- be **honest!**
- **trust them!**

For more information:

- NETPOULSAFE project: <https://www.netpoulsafe.eu>




This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).





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3.7 Online farm health team meeting using paint 3D and google maps to improve farm zoning.



ONLINE FARM HEALTH TEAM MEETING USING PAINT 3D AND GOOGLE MAPS TO IMPROVE FARM ZONING



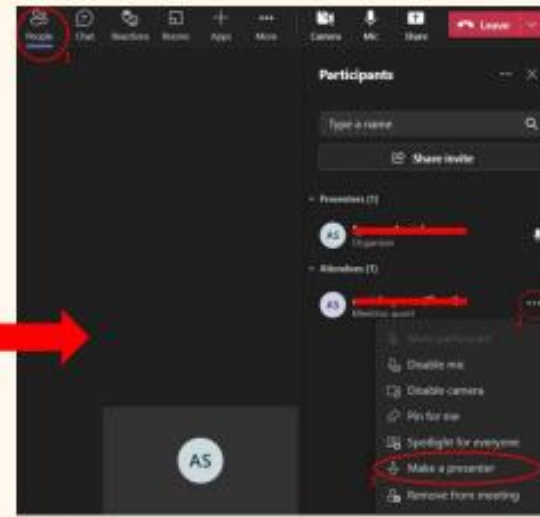





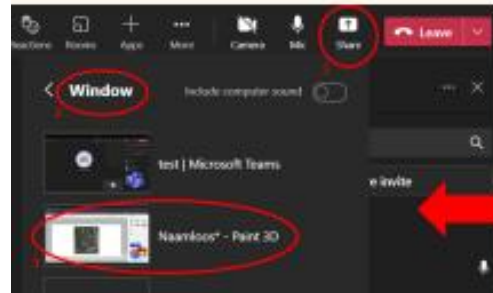
MAIN KEY POINTS


- In these times of high disease pressure, it is important to minimize visitors on your farm as most as possible to decrease the risk of pathogen introduction.
- Bringing a team of farmer, vet, feed and farm advisors together is bringing different sources of knowledge together, making it an effective team to improve biosecurity on farms.
- Online meetings give many opportunities for this team, such as working on farm zoning improvement together by using Microsoft Paint 3D and Google Maps. How you can do this will be explained in this factsheet.

1. Make a screenshot of your farm on Google Maps. Paste the screenshot in Microsoft Paint 3D.
2. Organise an online Microsoft Teams meeting with your farm health team (e.g. farmer, veterinarian, advisor(s), coach)
3. Give all participants in the Teams meeting the right to be a presenter.





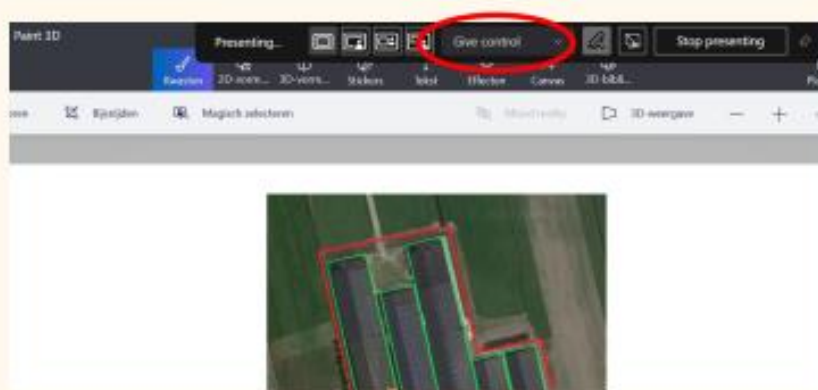




4. Share your window: Microsoft Paint 3D.

ONLINE FARM HEALTH TEAM MEETING USING PAINT 3D AND GOOGLE MAPS TO IMPROVE FARM ZONING

5. Give a participant control of your shared screen, making it possible to see two persons moving around on the screen with their cursor, to work together. *Note: 2 people maximum, only possible on MS Teams computer application.*



Alternatively, a participant can also request control:



6. Time to start drawing: identify the farm zones* using three different colours: green, orange and red. Use in Microsoft Paint 3D the function '2D shapes - line' for this.

*Farm zoning

<p>In the red zone (dirty area) is the parking lot and the lot up to the entrance to the hygiene lock.</p>	<p>In the orange zone (transition road) is the hygiene lock, where showering and changing clothes take place, and the premises up to the entrance to the poultry houses. In this zone, the transition from the red zone to the green zone and vice versa takes place.</p>	<p>The animal areas are located in the green zone (clean area). This area is closed off from the red zone and can only be reached via the hygiene lock in the orange zone.</p>
--	---	--

ONLINE FARM HEALTH TEAM MEETING USING PAINT 3D AND GOOGLE MAPS TO IMPROVE FARM ZONING

7. Identify the important farm elements regarding biosecurity on the farm by using different symbols and colours. Use in Microsoft Paint 3D the functions '2D shapes – line, square and cross' for this. Use different colours (see legenda).
8. Identify the walking and transport routes using different colours. Use in Microsoft Paint 3D the function 'Brushes - marker' for this (see legenda).

	Green zone		
	Orange zone		
	Red zone		
	Parking lots		Route of: Visitors & farm workers
	Carcass storage		Carcass collection
	Manure storage		Manure collection
	Egg storage		Egg collection
	Egg sales		Egg buyers
	Feed silos		Feed delivery

Example of a legenda (layer farm)



Work in progress in Paint 3D (broiler farm)

9. During and after these exercises, critical points of improvement regarding biosecurity becomes clear. Discuss these points with your team and think about a SMART action plan (see NETPOULSAFE factsheet: Improve biosecurity with your Multi-Actor Farm Health Team).

Tip: this is also a nice method for cross-learning! Doing this meeting together with other farm teams gives insight in how other farmers are managing their biosecurity. By adding photos of important farm elements regarding biosecurity, it offers a complete overview of the farm including zoning, walking and transport routes of the farm.

For more information:


- NETPOULSAFE project : <https://www.netpoulsafe.eu>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).*




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3.8 Training for farmers on how to prepare the workspace for the veterinarian on the farm.




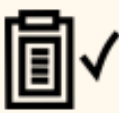
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TRAINING FOR FARMERS ON HOW TO PREPARE THE WORKSPACE FOR THE VETERINARIAN ON THE FARM



MAIN KEY POINTS:

- Having a dedicated diagnostic station for necropsy prevents the spread of infections on farm
- Implementation of training programs for Farmers focusing the preparation of the appropriate technical base for the safety and effective work of the visiting veterinarian.



- The establishment of appropriate dedicated procedures (*including procedures for clinical examination and necropsy of birds*), as well as **dedicated rooms**, aims to help the veterinarian to enter and leave the farm safely and accelerates the diagnosis and proper treatment of the flock in case of problems.
- This is crucial to avoid cross contamination of farm!

In the **room accessible only to a vet**, there should be:

1. **secured cabinet** for medicinal products and devices and personal protective equipment,
2. **room for necropsy** with an appropriate working space and dedicated equipment for post-mortem examinations.

TRAINING FOR FARMERS ON HOW TO PREPARE THE WORKSPACE FOR THE VETERINARIAN ON THE FARM

1. Locate the post-mortem diagnostics station in a place inside the room for carcass storage
2. Prepare a small table and the tools for necropsy
3. The place should be easy to clean and should be disinfected after each use



Such **training** for Farmers is essential for the effective implementation of biosecurity practices on the poultry farm and is intended to make producers aware of the importance of this issue.

For more information


- NETPOULSAFE project : <https://www.netpoulsafe.eu>



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3.9 Can the integrated company be a supporting measure?




CAN THE INTEGRATED COMPANY BE A SUPPORTING MEASURE?

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MAIN KEY POINTS

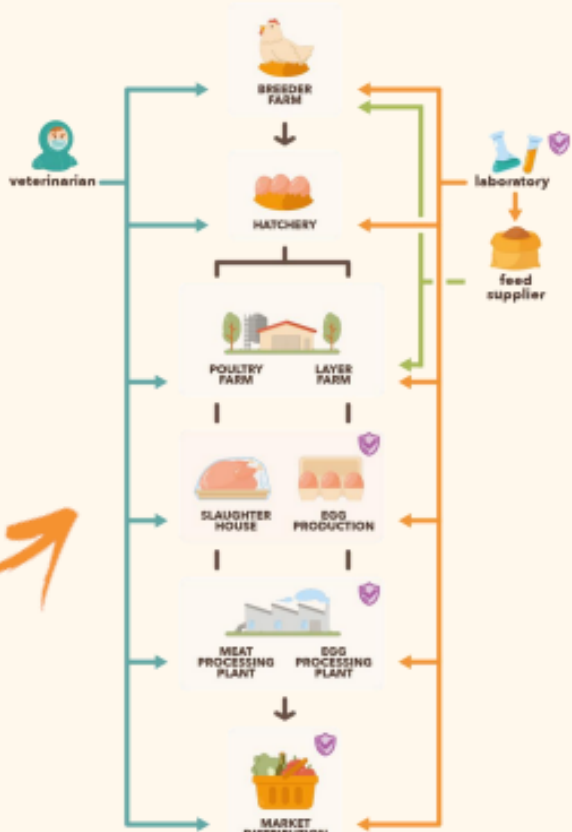
- **Integrated company in poultry production**
- **Benefits for the farmer**
- **Supporting measure**


Have you ever heard about «**integrated company**»? It is a system that controls the **entire poultry production chain** from feed manufacturing for the birds to the distribution of the final product

This integrated system allows a **capillary control** in **all steps of the poultry production** by the company, including farm activities performed by the farmer

Click here for more information on poultry production in Italy





 quality assurance

CAN THE INTEGRATED COMPANY BE A SUPPORTING MEASURE?

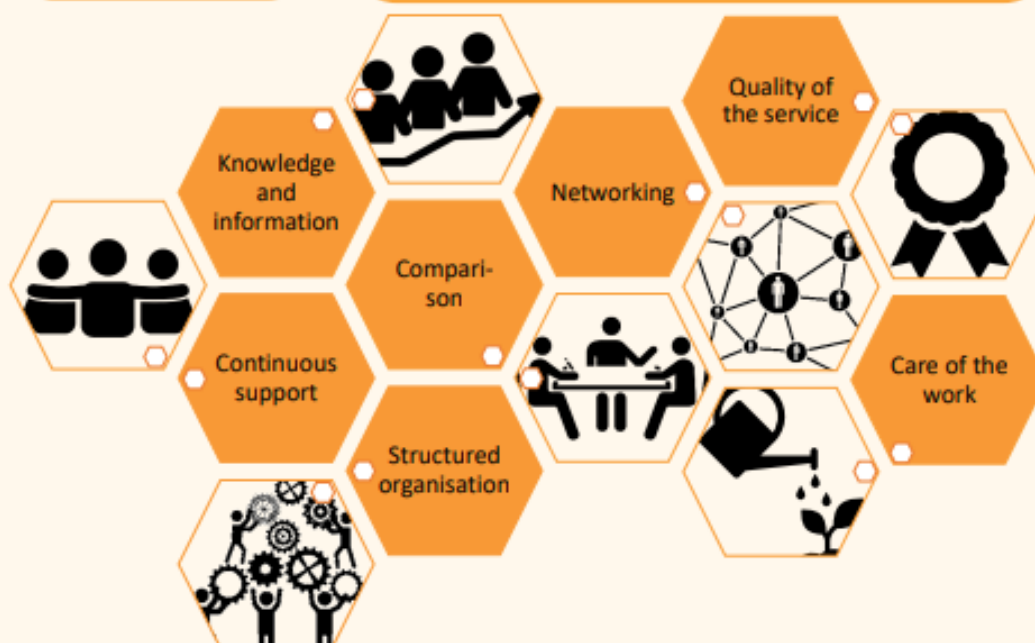
In this system **farmers** are tied to the integrated company by providing the labor, the structures and the resources



Click here to learn more about the role of company vet and technician!



But what does it mean **belonging to an integrated system** in poultry production? We asked some farmers...



Dialogue, trust and competence are the basis for a good company cooperation. The achievement of specific business objectives is also facilitated in terms of **biosecurity** (attention to details and continuous implementation). So, the presence of the **integrated company** is, in all respects, a **supporting measure** for the farmer to improve biosecurity

For more information:

- [Click here for more information on poultry production in Italy!](#)
- [Click here for more information on the role of company technician/vet in the farm!](#)
- [Click here to access an e-learning course on biosecurity in poultry production!](#)
- NETPOULSAFE project: <https://www.netpoulsafe.eu>

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Links:

[Click here for more information on poultry production in Italy!](#)

[Click here for more information on the role of company technician/vet in the farm!](#)




[Click here to access an e-learning course on biosecurity in poultry](#)

3.10 Costs related to an avian influenza (HPAI) positive farm in Spain.



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COSTS RELATED TO AN AVIAN INFLUENZA (HPAI) POSITIVE FARM IN SPAIN



MAIN KEY POINTS

- Important for farmers to know the approximate cost Avian influenza outbreaks
- Cost related losses productivity due slaughter

Unlike in the case of *Salmonella*, a positive result for **Avian Influenza (HPAI)** in a poultry farm entails the **compulsory slaughter** not only of the affected flock but also of the rest of the flocks on the farm and in some cases, in the opinion of the competent authority, of other epidemiologically related farms.



COSTS RELATED TO AN AVIAN INFLUENZA (HPAI) POSITIVE FARM IN SPAIN



In the hypothetical case where a farm with 40,000 hens with a production cycle of 95 weeks (equally distributed in 2 houses) is infected with AI and they have been **culled or died** at 60 weeks, this would mean the loss of around **7,880,000 eggs** (197 eggs lost per hen). If the cost per egg is €0.208, the loss of economic value would amount to **€1,639,040**.

To this cost should be added the minimum **sanitary break time** after the second cleaning and disinfection of **42 days** (you can't repopulate with new animals).



COSTS RELATED TO AN AVIAN INFLUENZA (HPAI) POSITIVE FARM IN SPAIN

The **competent authority compensates** the farm for the value of the slaughtered animals and the eggs and feed present on the farm at that time. **It also covers the cost of the slaughter and disposal of the affected animals, as well as the destruction of the feed and eggs present and the cleaning and disinfection work.**



It is crucial to always implement and apply the correct biosecurity measures **to reduce the likelihood of farms becoming infected with Avian Influenza virus** in order to **reduce the associated costs.**



For more information:


- NETPOULSAFE project : <https://www.netpoulsafe.eu>



*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).




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3.11 Related costs in a salmonella-positive herd in Spain



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RELATED COSTS IN A SALMONELLA-POSITIVE HERD IN SPAIN



MAIN KEY POINTS

- Important for farmers to know the approximate cost *Salmonella* outbreaks
- Cost related losses productivity due slaughter (meat and eggs)

It is of interest for farmers of **both broilers and laying hens** to know what kind of costs they may face in case a flock on their farm is positive for *Salmonella* Enteritidis or Typhimurium (including the monophasic variant).

- 1** BROILERS 
- 2** LAYERS 

RELATED COSTS IN A SALMONELLA-POSITIVE HERD IN SPAIN

1

BROILERS



In broilers, in case of a positive field test for these serotypes, it can be decided whether to perform a **depopulation in the field (by-products destiny)** or to **slaughter them at the slaughterhouse** and marketed them under certain circumstances (negative carcass analysis or heat treatment).



Regarding the **estimation of economic losses**, in the **hypothetical case** that a flock of 20,000 broilers would have been slaughtered at 42 days of life with 3 kg of weight, this would mean the loss of around 60,000 kg of live chicken. If we consider that the cost per kg of live chicken is 1.2 €, this translates into a total loss of approximately **72,000 €**.

RELATED COSTS IN A SALMONELLA-POSITIVE HERD IN SPAIN

1

LAYING HENS



In **laying hens**, in case of a positive field test for these serotypes, the eggs cannot be sold fresh, only as egg products (heat treatment), losing part of their value.

Therefore, it may be decided to cull the animals in order to be able to sell fresh eggs from a new flock as soon as possible after **cleaning and disinfection**.

In case the competent authority orders compulsory culling, there will be a **financial compensation** per animal according to its age (RD 823/2010).

In the **hypothetical case** where a farm with 20,000 hens with a production cycle of 95 weeks is infected with *Salmonella* and they have been culled at 60 weeks, this would mean the loss of around **3,940,000 eggs** (197 eggs lost per hen). If the cost per egg is €0.208, the loss of economic value would amount to **€ 81,520**.

RELATED COSTS IN A SALMONELLA-POSITIVE HERD IN SPAIN

In addition to the costs related to the loss of value of the products, **costs related to the slaughter and destruction of carcasses, cleaning and disinfection** should be taken into account. In the case of broilers, the feed and energy consumed so far should also be taken into consideration.

It is essential to apply correct biosecurity measures to minimise the risks of *Salmonella* introduction in farms and thus **reduce the related costs.**



For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>



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3.12 Water quality control by belplume quality label.



WATER QUALITY CONTROL BY BELPLUME QUALITY LABEL







MAIN KEY POINTS

- Maintain a closed drinking water system.
- Biofilms in waterlines protect germs from disinfectants.
- Check water quality at end of the drinking line.

Common problems encountered with unsafe water sources

Contaminated/ tainted water is less palatable; therefore, chicks will drink less of it. This will have an impact on digestion and productivity.





The fact that chickens regularly use puddles in outdoor systems as drinking spots is a serious problem because the puddles could get contaminated by wild animals, birds, or rodents.

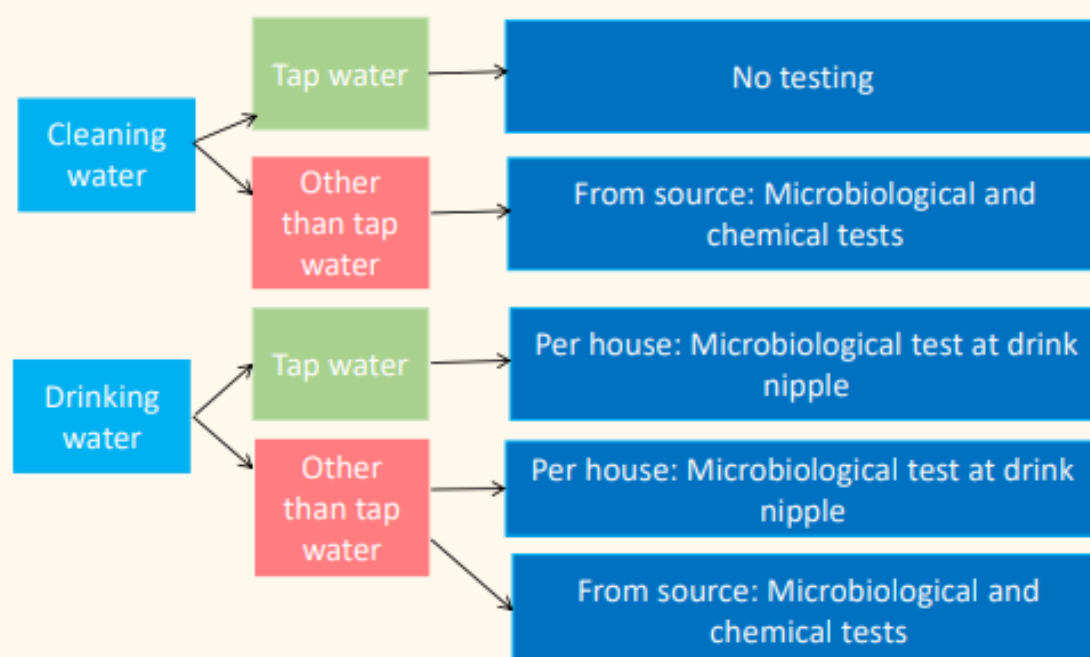
Biofilms are a continuous source of infection because bacteria can survive there and hide from the active ingredients in cleaning products.



Biofilm in a pipeline

WATER QUALITY CONTROL BY BELPLUME QUALITY LABEL

Belplume protocol for safe cleaning and drinking water



When under the Belplume quality system, the poultry farmer must:

- Have a closed drinking water system.
- Inspect daily for proper functioning of the drinking water system.
- Check purity of the water at the source.
- Check purity of the water at the drinking points.
- Drinking water is tested annually.
- Untreated surface water or rainwater is prohibited.

WATER QUALITY CONTROL BY BELPLUME QUALITY LABEL

Test result and measures	Normal	Tolerated (permissible deviation)
Bacteriological parameters		
Total bacterial count	Max. 100,000 cfu/ ml	
Total E.coli	Max. 1000 cfu/100 ml	
Fecal Streptococci	Absent in 100 ml	None
Yeast / Mold	Max. 10,000 per ml	
Chemical Parameters		
pH (acidity)	4-9	10%
Iron	2,5 mg/l	
Hardness	20 ° dH	
Nitrite	1,0 mg/l	10%

- If Belplume standards are not met, the water source can no longer be used.
- If the bacteriological standards are above the permitted deviation, the drinking water system should be cleaned and disinfected as soon as possible.
- If the acidity and/or nitrite content is above the standard by more than 10%, then appropriate measures must be taken, and water checked once again.
- Hardness has no direct consequences on health but will inhibit the effectiveness of some disinfectants.

For more information:

Link to the video:

<https://www.youtube.com/watch?v=ufUPSik29Qg&t=30s>

 NETPOULSAFE project : <https://www.netpoulsafe.eu>



"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).

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 Link to the video: <https://www.youtube.com/watch?v=ufUPSik29Qg&t=30s>


4 Supporting measures for advisors


4.1 Objectively measuring the biosecurity status through the Biocheck.Ugent scoring tool.



OBJECTIVELY MEASURING THE BIOSECURITY STATUS THROUGH THE BIOCHECK.UGENT SCORING TOOL








MAIN KEY POINTS

- Measure biosecurity level
- Online scoring tool
- Commercial poultry biosecurity



At Ghent University, the Biocheck.Ugent™ biosecurity scoring system was developed for poultry, pigs and cattle farming (www.biocheck.ugent.be) and allows to quantify the on-farm biosecurity levels. The Biocheck.Ugent™ online tool is freely accessible to everybody and its use is free of charge.

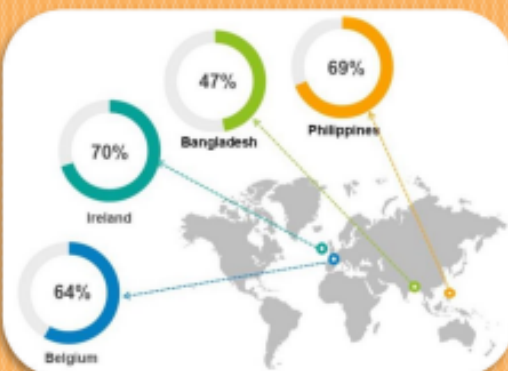
The online tool focuses on biosecurity measures related to the transmission of different types of infectious poultry diseases.

The quantitative assessment can identify poor areas of biosecurity compliance.

The Biocheck report helps to set quantitative goals and benchmarks.

Improvements in farm operations can be easily planned and carried out.

The scoring system is being used worldwide and provides the user the nation wise scores and world average scores.



Country	Score (%)
Belgium	64%
Ireland	70%
Bangladesh	47%
Philippines	69%

Total biosecurity score - statistics for broilers (June, 2022)

OBJECTIVELY MEASURING THE BIOSECURITY STATUS THROUGH THE  BIOCHECK.UGENT SCORING TOOL

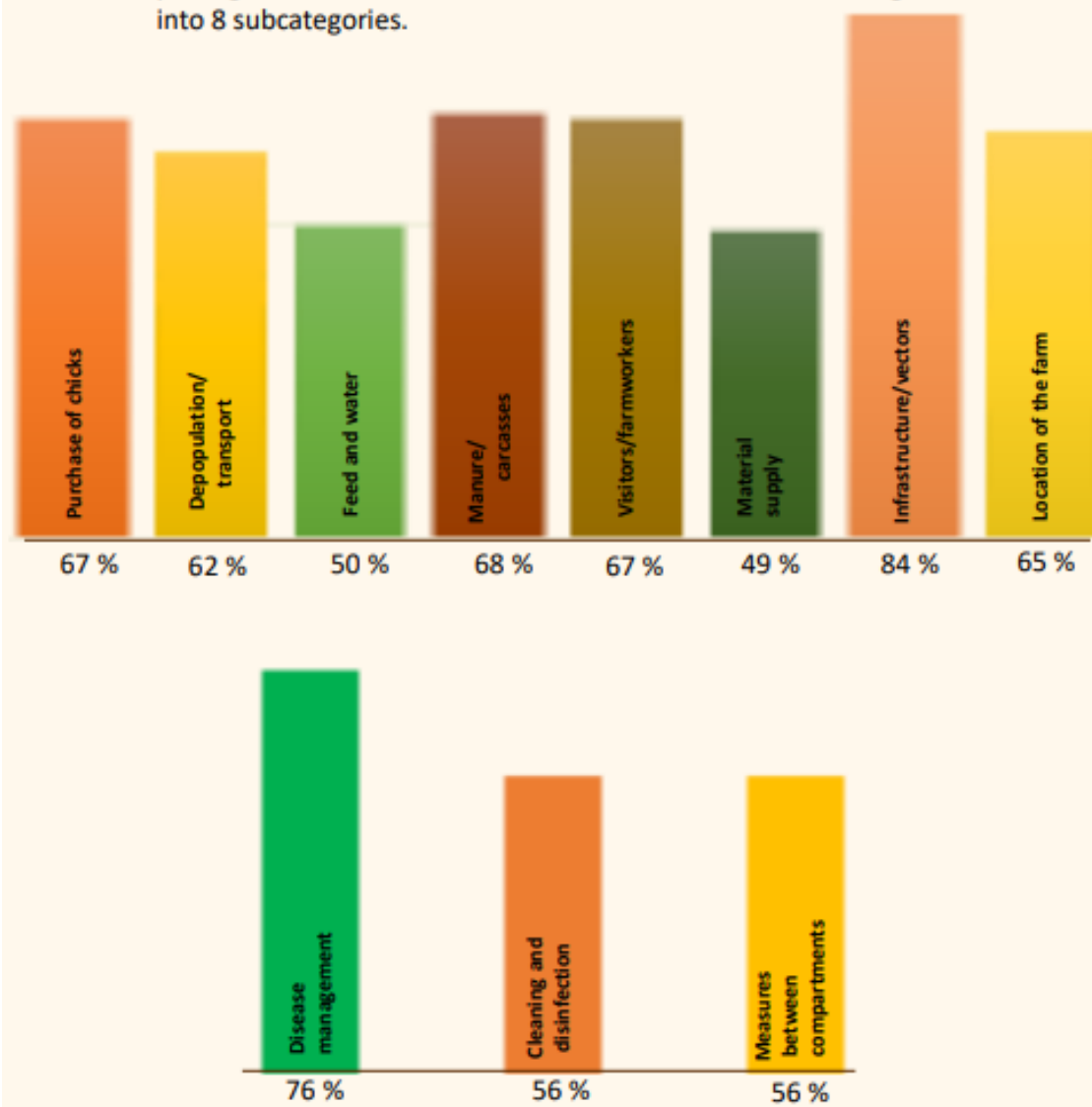
The Biocheck questionnaire is based on the principles of bio-exclusion and bio containment. It consists of a series of questions (measures) that are divided into two main categories.

External biosecurity

measures preventing the introduction of off-farm pathogens and is subdivided into 8 subcategories.

Internal biosecurity

measures preventing the spread of pathogens inside the farm and is subdivided into 3 subcategories.



Biocheck scores - Statistics for broiler farms in Belgium (June 2022)

OBJECTIVELY MEASURING THE BIOSECURITY STATUS THROUGH THE BIOCHECK.UGENT SCORING TOOL

WHO can fill ?

The questionnaire can be filled in by anybody who wants to do so, yet experience learns that it is often done by veterinary consultants or advisors.

HOW to fill ?

A brief farm visit to observe the farm prior to filling the questionnaires and also asking the farmer to explain their daily routine.

Data protection ?

All information is stored anonymous in a fully secured database and is fully protected according to the GDPR regulations.

External biosecurity

A. Purchase of one-day-old chicks	79%
B. Depopulation of broilers (slaughterhouses, traders, individuals)	54%
C. Feed and water	64%
D. Removal of manure and carcasses	50%
E. Visitors and farmworkers	90%
F. Material supply	30%
G. Infrastructure and biological vectors	60%
H. Location of the farm	64%
Subtotal external biosecurity	67%

WHAT to do after ?

The report will show the scores gained. These results can be discussed with the farmer to draw an action plan focusing on areas that scored low.

The scoring system

The answer to every question results in a score between zero and one.

- '0' when the measure is not implemented at all
- '1' when the measure is fully implemented.

The score is multiplied by a weight factor. The subcategories have a specific weight factor equal to their relative importance for disease transmission.

The final score for both internal and external biosecurity ranges from zero, indicating a total absence of biosecurity measures, to 100, indicating a full application of the measures.

Biocheck submissions



Worldwide submissions



Biocheck is used in many countries and is available in many languages - English, Dutch, Finnish, French, German, Italian, Spanish, Chinese, Russian, Albanian, Vietnamese

For more information:

- Link to scientific publications <https://doi.org/10.3382/ps.2014-04002>
- NETPOULSAFE project : <https://www.netpoulsafe.eu>

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe)."



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Link to scientific publications <https://doi.org/10.3382/ps.2014-04002>

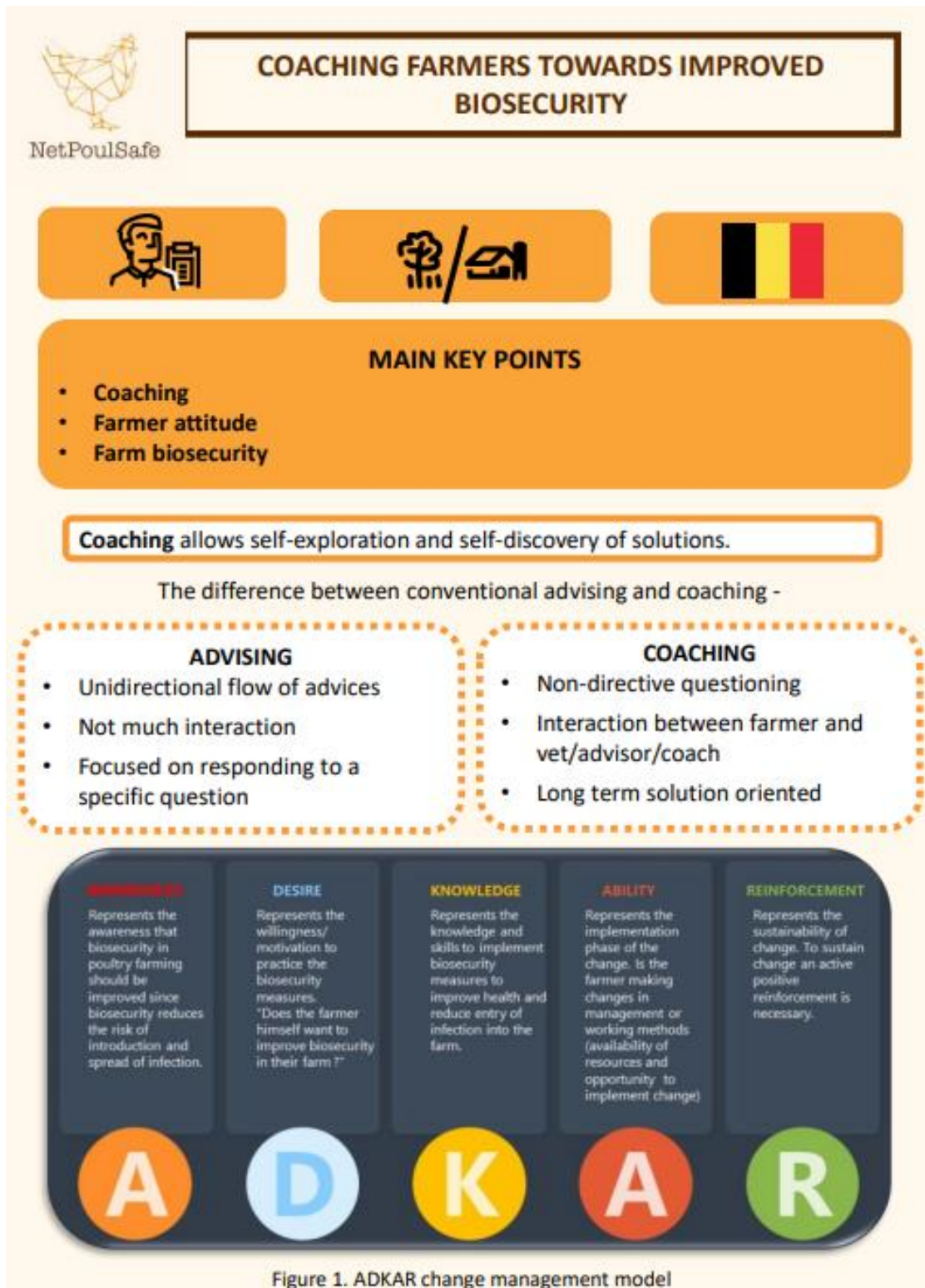


Figure 1. ADKAR change management model

COACHING FARMERS TOWARDS IMPROVED BIOSECURITY



Figure 2. The Coach, facilitator, veterinarian and broiler farmer at a coaching session.
Coaching is the selected supporting measure for Belgium

As a coach, one should be able to do the following:

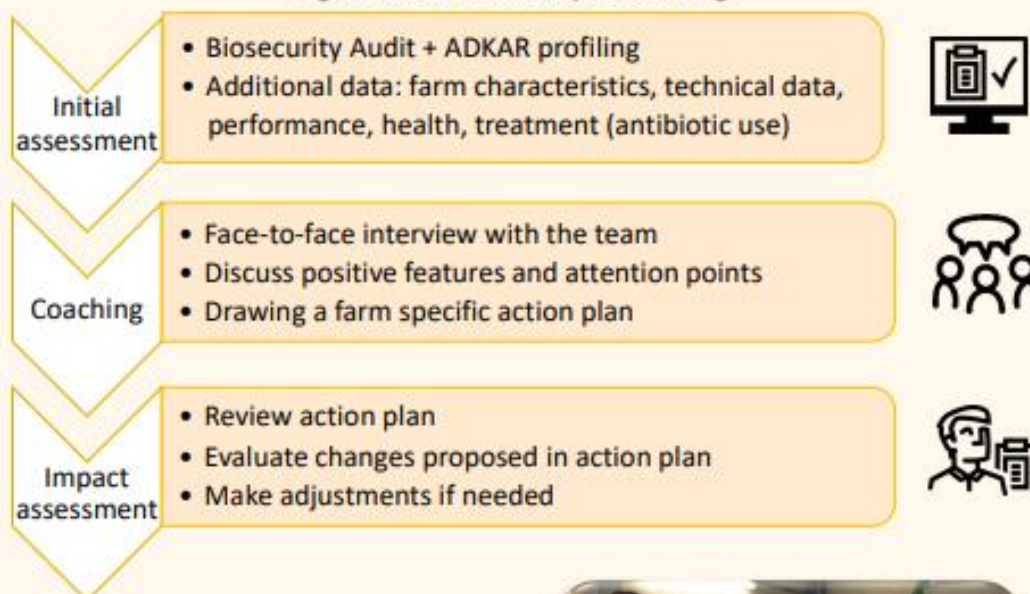
- Asking the right questions.
- Identifying what the farmer/ veterinarian/ feed representative want to achieve.
- Encouraging their strengths and values.
- Making them take the responsibility (feel accountable) for the problems in the farm.
- Focusing on future rather than past.
- Being a good listener.
- Being able to make an assessment of current situation or problem.
- Being able to define the goals to chart an action plan.

The Livestock-adapted **ADKAR** change management model can be used as a starting point for coaching to assess farmers' attitudes and behavior regarding biosecurity.

The coach at the end of the interaction must make a summary based on the response of the team and also based on their non-verbal communication.

COACHING FARMERS TOWARDS IMPROVED BIOSECURITY

Figure 3. Overview of steps in Coaching



For a successful coaching outcome –

- the farmers should alter their wrong working habits, routines and management practices .
- the farmer has to go through a challenging behavioural change process.
- the farmer should sustain the changes and not relapse to the old working routines and habits.
- the action plan should be reviewed periodically.



Figure 4. Initial farm evaluation and data collection before coaching



Figure 5. Coaching by Hilde van Meirhaeghe (VETWORKS)

For more information:

- Link to the podcast: <https://www.youtube.com/watch?v=T2ZEVrfTuEM&t=436s>
- Link to scientific publications: <https://doi.org/10.3390/antibiotics10050590>
- NETPOULSAFE project : <https://www.netpoulsafe.eu>



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- Link to the podcast: <https://www.youtube.com/watch?v=T2ZEVrfTuEM&t=436s>
- Link to scientific publications: <https://doi.org/10.3390/antibiotics10050590>

4.3 Training of poultry farmers on biosecurity.



- MAIN KEY POINTS**
- Education/ Training on biosecurity
 - Biosecurity in poultry farms
 - Train the trainers

Human intrusion into broiler houses can happen 50 to 150 times during the life of a flock. This is unavoidable due to production and maintenance practices, and poses a significant risk for introducing pathogens (e.g. Campylobacter sp.) into the flocks.
 - Wagenaar et al. 2006

Training the workers for various poultry farm operations with a biosecurity perspective can be a good investment for the farm.



Biosecurity training for workers in the poultry industry would help to improve hygiene conditions, animal health, productivity and quality.

Training should be offered in the form of:
 Workshops, seminars and e-learning

Who needs training ?
 A cross-sector approach to educate -

- farm managers
- farm workers
- hatchery employees
- catching crew
- truck drivers
- feed advisors
- veterinarians

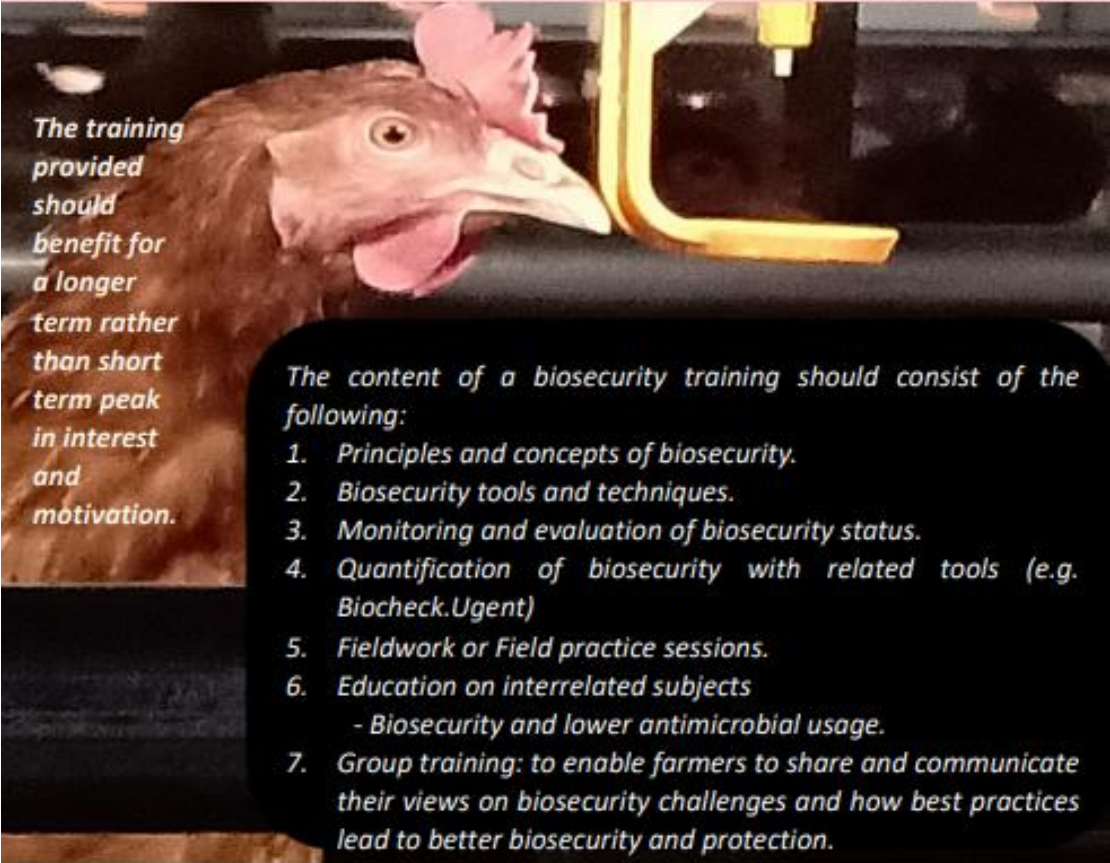
TRAINING OF POULTRY FARMERS ON BIOSECURITY

Train the trainers

Once the highest authority of a sector/farm/organization get the training, they can in turn train other people and so, with time, this can affect the biosecurity understanding of all the poultry personnel.

Cascade training process

Leaders of poultry associations should be trained to raise awareness among poultry farmers to spread good practices quickly. One team/company member should be trained to transfer knowledge to others who are closely associated with day-to-day operations in poultry farming



The training provided should benefit for a longer term rather than short term peak in interest and motivation.

The content of a biosecurity training should consist of the following:

- 1. Principles and concepts of biosecurity.*
- 2. Biosecurity tools and techniques.*
- 3. Monitoring and evaluation of biosecurity status.*
- 4. Quantification of biosecurity with related tools (e.g. Biocheck.Ugent)*
- 5. Fieldwork or Field practice sessions.*
- 6. Education on interrelated subjects
- Biosecurity and lower antimicrobial usage.*
- 7. Group training: to enable farmers to share and communicate their views on biosecurity challenges and how best practices lead to better biosecurity and protection.*

Training in biosecurity does not take a fixed form.

The type and level of training depends on the needs of those to be trained.

E.g. For improved biosecurity during depopulation/ thinning, an effective biosecurity training, as well as cognitive and behavioural modification training should be given for all catching crew companies.

TRAINING OF POULTRY FARMERS ON BIOSECURITY

Education of farmers aims at learning and problem solving.

Benefits of education/training:

- *Trained farmers become better decision makers.*
- *Education will translate into better income.*
- *Helps to understand the need for enforcing farm hygiene.*
- *Helps to be up to date with new innovations.*
- *Helps farmers to understand new concepts and apply knowledge in farming.*
- *Well trained farmers will be more prepared to cope with emerging challenges.*
- *Training would also strengthen the capacity of veterinary services.*



Figure 1. Biosecurity training for farmers by Hilde van Meirhaeghe (VETWORKS)

Public and private sectors providing training programmes for poultry farmers should also focus on "Biosecurity related":

- *Knowledge*
- *Skills*
- *Abilities*
- *Behavior*
- *Improvement*
- *Sustainability*

For more information:

NETPOULSAFE project : <https://www.netpoulsafe.eu>

References:

- de Goede, L. (2015). An Analysis of Strategies to educate Dutch Poultry Farmers about Sustainability Issues <https://doi.org/10.1590/S1516-635X2013000200001>

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe)."



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References: de Goede, L. (2015). An Analysis of Strategies to educate Dutch Poultry Farmers about Sustainability Issues <https://doi.org/10.1590/S1516-635X2013000200001>

4.4 Participatory approach to better support poultry farmers in biosecurity.



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PARTICIPATORY APPROACH TO BETTER SUPPORT POULTRY FARMERS IN BIOSECURITY







MAIN KEY POINTS

- Participative workshops constitute an interesting tool to accompany the farmers in the management of change
- The meetings animated by a facilitator, accompanied by the vet/advisor, consist in a working phase, a debate and an action plan. It is part of a 3-step approach at farm level including diagnosis, follow-up and final assessment.
- This tool has been successfully applied to biosecurity, allowing farmers to change their practices and mindset.

The participatory approach : definition and objectives

- Thanks to discussions between peers, it aims at empowering farmers to find solutions adapted to their own development issue (different from a training coming from the adviser)
- **It can help changing practices** (that is often a source of stress for farmers), or to be confirmed in a practice.
- It helps understanding a variety of points of view, motivations, limits and barriers for other farmers.
- It is both an attitude and a philosophy that encourages learning, discovery and flexibility.

4 factors that can explain a change of practice

I know, I understand
Knowledge

I think it is good
Representations : my values, my analysis and what I project

Others are influencing me
Social groups : peers, family, friends, advisers, sellers...

It is physically possible
Practical and economical aspects

I do so or I change doing so because...

PARTICIPATORY APPROACH TO BETTER SUPPORT POULTRY FARMERS IN BIOSECURITY

Structure and flow of a participative meeting



Organisation

- Optimal number of participants : 6-15
- Duration : ½ day or 1 day including meal
- Facilitator : vet/adviser + a co-animator (who should have been specifically trained)



A trained facilitator knows how to :

- Adopt the right verbal/non verbal attitude, and a listening behaviour
- Ensure equal speaking time for all participants
- Handle conflicts/disagreements between participants
- Build confidence between participants, favoring open discussions
- Manage meeting timing

Examples of animation techniques to stimulate exchanges :

- Brainstorming
- Roundtables
- « angel and daemon advocate »
- world café



Good preparation is the key of a successful meeting :

- Choice of a sufficiently **attractive, limited and precise theme**
- **Objectives precisely defined** before the meeting
- **Choose the audience** according to the theme and the objectives to guarantee a richness of the exchanges. The farmers must have a common framework (same production organization/specifications), a common objective to allow group cohesion and comparison.
- **Diversity of the audience with "good" and "bad" practices** to encourage discussion.

PARTICIPATORY APPROACH TO BETTER SUPPORT POULTRY FARMERS IN BIOSECURITY

Benefits for the participant:



- Feeling of belonging to a professional group and professional **recognition**
- Rich discussions that lead to solutions and allow farmers to progress together
- Credibility given to exchanges between peers
- Realise that other farmers and stakeholders are facing the same constraints.

Benefits for the facilitator:



- Building trust
- Be aware of and correct preconceived ideas
- Get to know some farmers better and be inspired by the discussions to bring good ideas
- Be an actor in the technical progress of the farmers



Example of use of the participatory approach in a 3-step process applied to biosecurity

The participative approach has been proven to be successful for farmers : in a 3-step process applied to biosecurity, to trigger and consolidate the change, in conjunction with individual assessments of farmers attitude before and after the meetings.

In Netpoulsafe project, the participative approach will be used in the pilot farms in France, to work on the farm biosecurity plan, to improve some specific points.

For more information:

- Le Bouquin S., Koulete E., Kling-Eveillard F., Boudet S., Scoizec A., Rousset N., 2020. Biosecurity in poultry farming: a participatory approach to promote compliance with biosecurity measures.

ISESSAH 2020 on Wednesday 11th to Friday 13th

- [Partage project](#)

- NETPOULSAFE project : <https://www.netpoulsafe.eu>


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).



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Link: [Partage project](#)


4.5 Biosecurity audit with the PULSE tool




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BIOSECURITY AUDIT WITH THE PULSE TOOL









MAIN KEY POINTS

- **PULSE is a biosecurity self-assessment tool for farmers that was developed by ITAVI, [available for different productions](#) :**
 - For broiler farms
 - For layer farms
 - For palmiped farms
- **It is a spreadsheet, including “macros”, designed as a progress tool, targeting the points to be improved (by calculating a score for each item), and to be discussed with farmer’s advisors (veterinarian, technician). A mobile app is under development.**

PULSE tool :

- Checks compliance with French regulations on biosecurity, for the following items (In the spreadsheet, 1 item = 1 tab) :

- A – Biosecurity plan.
- B – Hygiene lock.
- C – Cleaning and disinfection.
- D – Mortality.
- E – Outdoor range.
- F – Intrants
- G – Manure.
- H – Administrative matters and a final assessment.

BIOSECURITY AUDIT WITH THE PULSE TOOL

Pulse tool :

- PULSE can be used by the farmer (self-assessment) or by the adviser (who makes the audit with the farmer).
- For each item, the auditor checks about biosecurity practices done in the farm.
- Each answer gives points
- A total score is calculated for each item/tab and leads to a conclusion
 - Satisfactory (green)
 - To be improved (orange)
 - Non compliant (red)

3 Screen captures of the excel tool (in French) showing intrants, hygiene lock and manure management grids to fill up.

LES INTRANTS		Répondre dans cette colonne
1	J'ennegaire ou conserve les données de livraisons d'aliment et j'assure la traçabilité de mes stocks	Systematique
2	Je protège mon stock d'aliment de l'humidité et de la faune sauvage (oiseaux, rongeurs)	Oui
3	Je stocke ma litière à l'abri de l'humidité et la protège de la faune sauvage en utilisant des filets (ou bâches)	Oui
4	Je m'assure quotidiennement de la qualité de l'eau distribuée à mes animaux	Systematique
5	Je traite mon eau si elle n'est pas conforme aux recommandations de mon technicien ou vétérinaire	Mon eau est déjà conforme
		5
		SATISFAISANT !

LE SAS SANITAIRE		Répondre dans cette colonne
1	Un sas est présent à l'entrée de chaque LIP	Oui
2	La zone propre (ou zone d'élevage) et la zone sale (ou zone civile) sont séparées par un baril ou une séparation physique	Un baril ou une séparation physique
3	Mon sas est équipé de matériel conforme, il comprend :	
3.1	Un lavabo fonctionnel (avec eau courante et système d'évacuation)	Oui
3.2	De savon	Oui
3.3	Du papier jetable (sans-main)	Oui
3.4	Une poubelle vidée régulièrement	Oui
3.5	Un porte vêtements	Oui
3.6	Une tenue et des chaussures propres, réservées à la zone d'élevage	Oui
4	Avant de pénétrer dans une Unité de Production, je respecte les étapes suivantes :	
4.1	J'enlève ma tenue civile et mes chaussures en zone sale (ou zone civile)	Systematique
4.2	Je me lave les mains avec du savon	Systematique
4.3	Je mets une tenue et des boîtes d'élevage en zone propre (ou zone d'élevage)	Systematique
5	Je m'assure de la traçabilité sur mon exploitation en inscrivant sur la fiche d'élevage tous les visiteurs et intervenants extérieurs pénétrant sur le site d'exploitation	Parfois
		11,5
		A AMELIORER

GESTION DU FUMIER			
Mon fumier est géré			
Sur votre exploitation	Oui	Cher un prestataire de terre ou dans un établissement agréé	Non
1	Plus aucune mention possible	Assure la traçabilité de mes exploitations de fumier	
2	Je respecte les recommandations de la loi de décharge et chaque entreprise diffuse son rapport aux zones sensibles, liste de végétaux sensibles (maïs, pois, soja, haricots, ...)	Oui	Je m'assure que le prestataire de terre ou le centre extérieur agréé respecte la réglementation en vigueur
3	Je déshydratis/épand le fumier sur mes parcelles	Non	
4	Je traite le fumier au moins par un procédé équivalent à l'eau	Oui	
5	Colonne de terre / pont avant de quitter la ferme ou centre agréé	Oui	
6	Je vérifie que le mélange et le déshydratation de mes exploitations de fumier, le transport, l'épandage et l'incinération de fumier sont effectués dans et après chaque étape	Systematique	
7	J'assure la traçabilité de mes exploitations	Oui	
		6	
		NON CONFORME	

BIOSECURITY AUDIT WITH THE PULSE TOOL

On the last tab, a **synthesis table** with the results for all tabs gives the farm profile.

The **non compliant points** can be explained and the farmer has to write an **engagement** to be compliant on these points before the next visit, explaining what he will do. The evolution, assessed during the **follow-up visit** can be written in the last column of the table, in order to make the changes visible.

BILAN					A compléter si de mieux en mieux sur "NON CONFORME" (ENGAGEMENT)		
CRITERES	EVALUATION	NOTE	TOTAL	COMMENTAIRE (Visite 1)		EVOLUTION (Visite 2)	
				Explications obligatoires pour les items "NON CONFORME" et proposition d'un plan d'action (à réviser) par l'auditeur	Engagement de l'éleveur pour mettre en conformité des items "NON CONFORME" (DUREN, si cas échéant, no. 454)	Quelques points "NON CONFORME" ont été levés suite à la nouvelle visite effectuée par l'auditeur (Changement de statut de l'item)	
LE PLAN DE BIOSECURITE	A AMELIORER	16	16		Désinfection systématique du matériel au changement d'UP et identification de la zone professionnelle à rendre plus explicite		
LE CAS VISITEUR	A AMELIORER	10	10		Improve tracability of ALL visitors		
LE NETTOYAGE ET LA DESINFECTON	SATISFAISANT	25	25				
LA BIENETUITE	SATISFAISANT	7	7				
LE PARCOURS	SATISFAISANT	6	6				
LES INTRANTS	SATISFAISANT	3	3				
LE FUMIER	NON CONFORME	6	7	Epandage immédiat sans enfouissement	Réaliser un épandage immédiat avec enfouissement		
ADMISTRATIF	A AMELIORER	10	10	Manque évaluation des risques liés à la présence de volailles non commerciales			
BILAN	NON CONFORME	40	40				

Screen capture of an example of report at the end of the assessment

For more information: [Download the excel file \(in French\)](#)



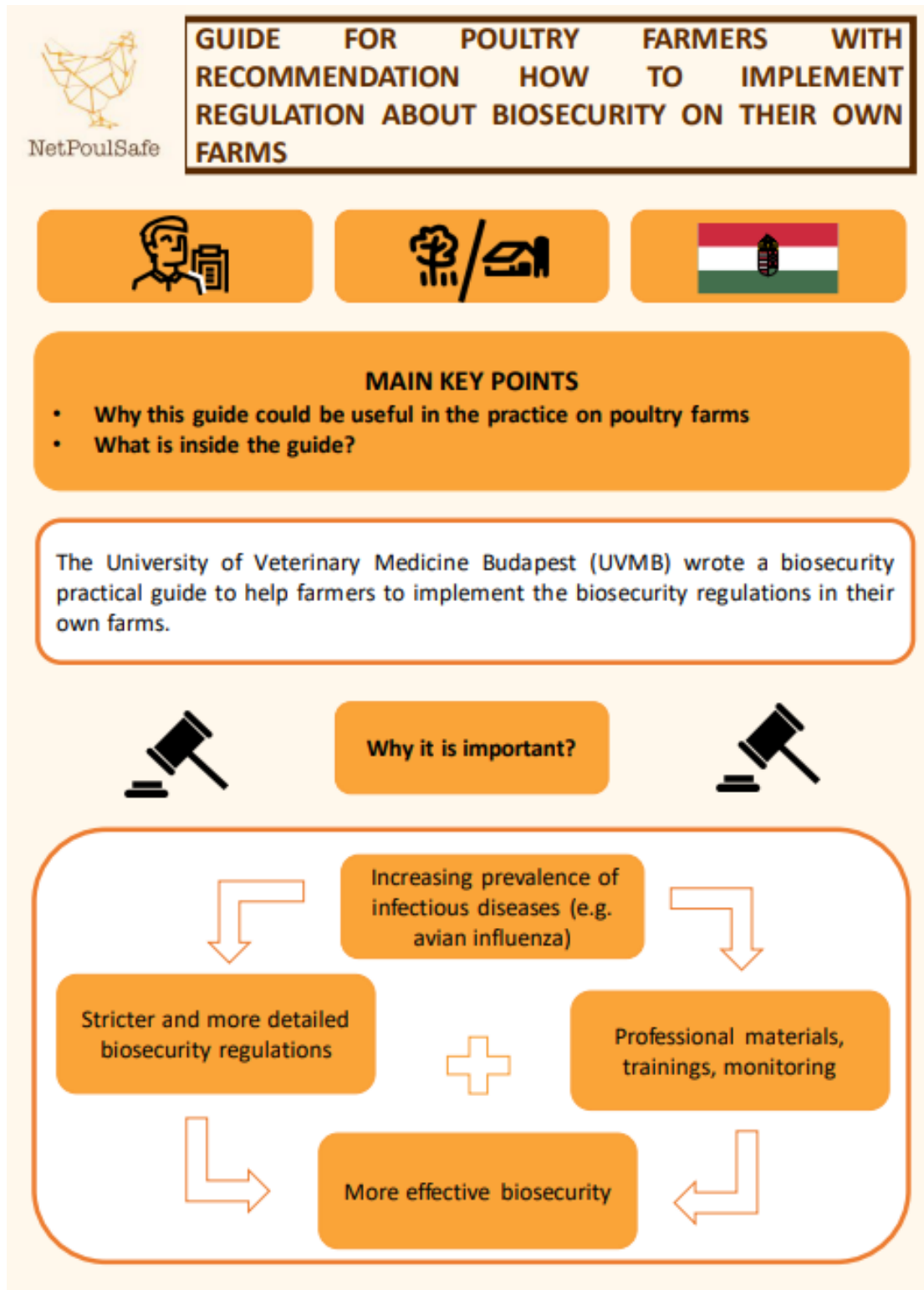
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).



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Link: [Download the excel file \(in French\)](#)

4.6 Regulation set up supporting biosecurity implementation preparation of professional proposals.



GUIDE FOR POULTRY FARMERS WITH RECOMMENDATION HOW TO IMPLEMENT REGULATION ABOUT BIOSECURITY ON THEIR OWN FARMS

What is the professional material made up of?

- What does biosecurity means?
- What are the essential elements of biosecurity?
- Hygiene locks – the crucial part of the good farm hygiene
- Why is it important to protect poultry farms against infectious diseases?
- Prudent way of using antimicrobials products.
- Improper and correct practices, good and bad examples
- Recommendations, improvements

For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).



4.7 Get to know yourself and your advisors for good collaboration.



GET TO KNOW YOURSELF AND YOUR ADVISORS FOR GOOD COLABORATION







MAIN KEY POINTS

- Everybody is different. Everyone has their own characteristics, personality, habits and needs, which is reflected in your type of "beast"*.
- If you need to collaborate intensively in a team (e.g. coaching trajectory), begin with the following exercise with your team members: discuss with each other which type of beast you are by using the image below. Then, use the information of page 2 and 3 to understand how to communicate best to your teammates. Communication that is tailored to another's type of beast is more effective.
- By understanding each others' characteristics, how others react and behave, you give the cooperation in the team a good start. It stimulates a good relationship and good communication.

*The nature of the beast distinguishes four 'beasts'. All with their own characteristics, which are typical of our entrepreneurship.

<p>Qualities: Calm, thoughtful, analytical, facts, structure, a deal is a deal.</p> <p>Pitfalls: Picky, boring, rigid, conservative, certainties.</p> <p>Learnings: Structured, classroom, by skilled teacher.</p>	<p>Qualities: Decisive, confident, overseeing the big picture, prestige, own vision and taking risks.</p> <p>Pitfalls: Speed, taking too big risks, thinking big, always going for profits.</p> <p>Learnings: Roosters learn by doing and watching. Under stress, the rooster comes into his own.</p>
<p>Qualities: Diligent, hard worker, dedicated, honest, loyal to those around him, modest about own contribution.</p> <p>Pitfalls: Fanaticism, perfectionism, submissiveness, meddlesome.</p> <p>Learnings: Bee learns with others and likes to practice a lot.</p>	<p>Qualities: Creative, inspiring, enthusiastic, imaginative, positive, looking at the world with wonder.</p> <p>Pitfalls: Overly optimistic, chaotic, superficial and easily distracted.</p> <p>Learnings: Butterflies don't learn, they discover. Living and learning are the same for them.</p>

GET TO KNOW YOURSELF AND YOUR ADVISORS FOR GOOD COLABORATION

I'm an **owl** and I'm talking to a...



I have analyzed our working method again and I think we should do it a little differently, namely more carefully. After all, the figures show that we will then work more efficiently. What do you think?



How are you doing? Have you been working with each other in the new way? How did it feel? Will we continue to do it this way from now on?



I have the figures here, so you can see that this way of working produces more results. Do you agree with these new arrangements?



I guess you have already tried the new way of working? Isn't it nice? Shall we do it like this from now on?

I'm a **bee** and I'm talking to a...



In my opinion, the appointments in the company are not kept very well. Do you know why? What should we agree on in order to work together better in the company?



I feel that the atmosphere within the company is not so good. What do you think about that? What shall we do about it together?



I feel that things are not going well in the company, the results are lagging behind. What do you want me to do?



How are you doing? Do you feel at home in the company or could the atmosphere be better? Do you have any ideas on how to tackle that?

GET TO KNOW YOURSELF AND YOUR ADVISORS FOR GOOD COLABORATION

I'm a **rooster** and I'm talking to a...



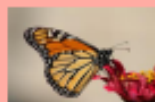
We won't make it in time if we don't take the first step with this project now. I've laid out the broad outlines here. Could you make it a detailed plan and indicate when what needs to be done?



I need your help (and that of others). It would be good for everyone if we start this now. Can you also have your piece ready for next week?



This project is not getting off the ground. Nothing is happening. Now if I do this and you are responsible for that part. What result will we achieve?



I feel like nothing is happening around this project. Do you have any ideas to get everyone excited again?

I'm a **butterfly** and I'm talking to a...



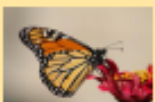
To improve this product, I do have an idea, but it has yet to be worked out in detail. These are the advantages and disadvantages. Would you like to take a closer look at these and make a proposal?



How are you doing? I was walking through the barn the other day and thought of something to make it better for all of us. Shall we take a look together and see how that could be done?



I have an idea for a new task. With it we can make a profit. Will you help me develop this idea?



For marketing this product, I have come up with a whole new idea. How do you feel about this? Maybe it can be done differently? Would you like to send me your ideas?

For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>




This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).


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4.8 Improve biosecurity with your multi-actor farm health team.



IMPROVE BIOSECURITY WITH YOUR MULTI-ACTOR FARM HEALTH TEAM










MAIN KEY POINTS

- **Bringing a team of farmer, vet, feed and farm advisors together is bringing different sources of knowledge together, making the Multi-Actor Farm Health (MAFH) approach an effective approach to improve biosecurity on farms.**
- **The toolbox of project DISARM facilitates this team by providing a guide to optimize farm health planning.**
- **This factsheet guides you through the different steps of the MAFH approach.**




Step 1 —  Establish your group and team collaboration

Step 2 —  Record baseline data for animal health, welfare, productivity, biosecurity and antibiotic use

Step 3 —  Determine your goals; set realistic targets by using SMART goal-setting and practical Action Planning

Step 4 —  Implement changes, log your progress and monitor key indicators of impact

Step 5 —  Evaluate your progress, discuss with your team and adjust your action plan accordingly

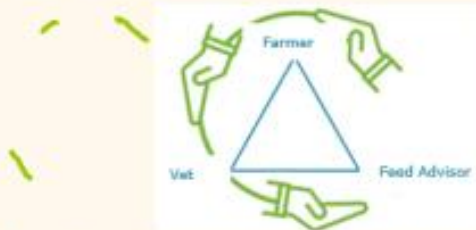
Advantages

- Three persons know more than one
- Coherent and streamlined advice in a tailor-made action plan
- Shared ownership, motivation and accountability from teamwork
- Support for farmer from other team members in making the change
- Farm Health Plan gives structure, traceability and overview of progress

IMPROVE BIOSECURITY WITH YOUR MULTI-ACTOR FARM HEALTH TEAM

Step 1: Creating your team and successful collaboration

"Together everybody achieves more"



Step 2: Mapping your starting situation – animal performance and health, biosecurity, antibiotic use and farm self-assessment

"If you can't measure it, you can't manage it"



Step 3: Design of the action plan (plan)



Define your actions SMART

Once you and your teammates have set the priority areas or issue to work on it is time to define SMART goals for improvement of these issues. Smart is an acronym from the management profession that stands for:

Specific

means that the description of the goal targets a specific area for improvement.

Measurable

the improvement should be measurable or at least an indicator to assess progress should be mentioned

Acceptable

the goal must be acceptable for all parties involved.

Realistic

the goal must be realistic to achieve with the given resources the team faces

Time-bound

the time frame: start of improvement and point in time the improvement ideally has been realized is clearly mentioned in the description

Example: my farm worker is going to order boots next Monday in sizes 36 to 46 so that all visitors will always use boots as soon as they visit the poultry houses.

IMPROVE BIOSECURITY WITH YOUR MULTI-ACTOR FARM HEALTH TEAM

Step 4: Implement changes, log your progress and monitor key indicators of impact (do)

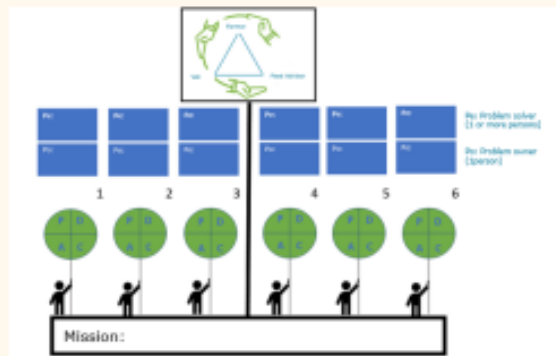
- Monday: order boots
- From week 28: I will check if all visitors always use boots as soon as they visit the poultry houses.

Who	•
What	•
When	•
Why	•

Step 5: Evaluate your progress, discuss with your team and adjust your plan accordingly (check+act)

Goal	Action	Due date	Project Owner	Project Solver	Status	Result
Biosecurity↑	Buy boots	20/6/2022	Farmer	Worker	In progress	Boots for all

“Keep all signs in the air!” In the end, multiple SMART goals with corresponding “Plan-Do-Check-Act (PDCA) circles” will be created by the Multi-Actor team to get closer to the mission (e.g. biosecurity compliance).



For more information:

- Best practice video: [Using a multi-actor plan on a goat farm - YouTube](#)
- DISARM MAFH approach toolbox: [Farm Health Team Toolbox - Disarm Project](#)
- NETPOULSAFE project: <https://www.netpoulsafe.eu>




This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).

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- Best practice video: [Using a multi-actor plan on a goat farm - YouTube](#)
- DISARM MAFH approach toolbox: [Farm Health Team Toolbox - Disarm Project](#)

4.9 Practical tool to assess the effectiveness of farm sanitary barrier.



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PRACTICAL TOOL TO ASSESS THE EFFECTIVENESS OF FARM SANITARY BARRIER



MAIN KEY POINTS

- Serological monitoring (ELISA panel) as a useful tool for Advisors for the evaluation of the farm sanitary barrier
- Chicken serological response as an indicator of the spreading pathogens on a farm with a negative impact on the production

A basic indicator of effective biosecurity is the absence of diseases and high production parameters. However even in flocks without clinical symptoms, activation of the immune system consumes not less than 3% of the metabolic energy that could be used to improve production performance*



Serological monitoring with the use of commercial ELISA kits for poultry is a very effective tool for the evaluation of the effectiveness of a farm sanitary barrier before the appearance of health problems.

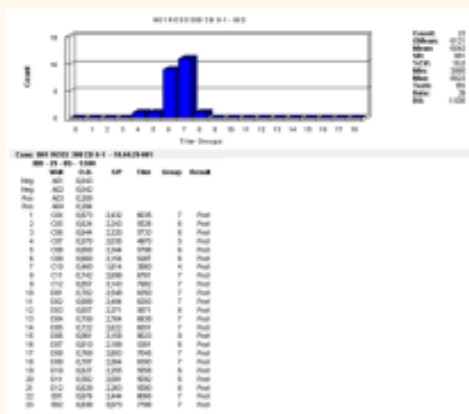
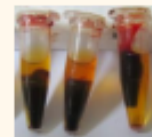
PRACTICAL TOOL TO ASSESS THE EFFECTIVENESS OF FARM SANITARY BARRIER

How to use the serological monitoring in practice:

Step 1: field collecting blood samples (optimally 23 samples) from clinically healthy birds at the end of production

Step 2: sending the samples to the dedicated laboratory for tests (ELISA panel)

Step 3: analyzing the results and based on the degree of seroprevalence the recommendation of the appropriate biosecurity procedures - e.g. targeted disinfection, improving the vaccination program, etc.



Order No. _____

REFERRAL TO SEROLOGICAL TEST

Client information: _____

Name of the farm and name of the farmer: _____

Address: _____

Phone: _____

City: _____

State: _____

Country: _____

Referral by: _____

Date: _____

Time of day: _____

Age of birds: _____

Sex of birds: _____

Number of birds: _____

Species of birds: _____

Reason for referral: _____

Test requested: _____

Test results: _____

Remarks: _____

PRACTICAL TOOL TO ASSESS THE EFFECTIVENESS OF FARM SANITARY BARRIER

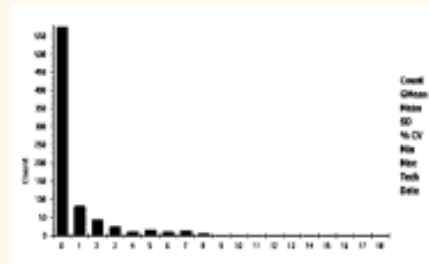
Panel of serological tests (ELISA)

ARV (*Avian Reovirus*)

CAIV (*Chicken Infectious Anemia Virus*)

REV (*Reticuloendotheliosis Virus*)

ORT (*Ornithobacterium rhinotracheale*)



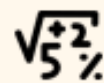
The lower the percentage of positive samples and the lower the serological response confirm lesser spread of a given pathogen, which has a lower impact on the production results.

Comparison of EPEF for positive and negative flocks in the different pathogens

PATHOGEN	% POS FLOCKS	AVERAGE EPEF	% OF NEG FLOCKS	AVERAGE EPEF
ARV	100	328,28	0	-
ORT	55,56	321,72	44,44	336,24
CAV	30,56	318,57	69,44	331,65
REV	16,67	297,2	83,33	334,25



Serological monitoring can be a useful indicator of the effectiveness of biosecurity programs in chicken flocks.



For more information:

*De Herdt P., Ducatelle R., Uytendaele E., Snee A., Torbeyns R.: Significance of Infectious Bursal Disease Serology in an Integrated Quality Control Program under European Epidemologic Condition. *Avian Diseases* 2000, 44 (3), 611-617.

*De Herdt P., Broedox M., Van Driessche F., Vermeiren B., Van Den Abeele G., Van Gorp S.: Improved Performance of Broilers and Broiler Breeders Associated with an Amended Vaccination Program Against Reovirus. *Avian Diseases* 2016, 60 (4), 841-845.

*McNulty M. S., McFroy S. G., Bruce D. W., Todd D.: Economic Effects of Subclinical Chicken Anemia Agent Infection in Broiler Chickens. *Avian Diseases* 1991, 35(2), 263-268.

*Szeleszczuk P., Kuszyński T., Nerc J., Dołka B.:

Monitoring serologiczny stad brojlerów kurzych, jako potencjalny wskaźnik efektywności programów biosekuracji.

I Międzynarodowa Konferencja Techniczna PROHEALTH: Biosekuracja


w zdrowotniejszej produkcji intensywniej zojczy chlewniej i drobiu inwestycja o najwyższej stopie zwrotu | Warszawa 04.09.2015., 68



"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe)."






4.10 BIOPON programme.



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BIOPON PROGRAMME






MAIN KEY POINTS

- Important for farmers to detect risk factors for entry of pathogenic micro-organisms.
- On-site Biosecurity audit.
- Individual report to train the farmer and scatter plot score report.

As you know it is important for layer farmers to know all the **risk factors** that their farm has for the entry of **pathogenic micro-organisms**. This will affect the economy of the farm due to the decreasing production or causing compulsory culling.

A good practice to identify these risk factors is that farmers take part in the **BIOPON programme**. A properly trained **veterinarian or advisor like you** will detect **specific hazards** of the whole farm and of each specific poultry house. This will be done as follows:

- 1**
 On-site Biosecurity Audits
- 2**
 Individual report to train the farmer
- 3**
 Scatter plot score report

BIOPON PROGRAMME

1

An on-site audit of the biosecurity measures (external and internal) implemented both at the level of the whole farm and specific to each house. At the end of the audit, a score is obtained for each house and an average for the whole farm.



Figure 1: Audit model

2

With the detected risk factors, either due to non-implementation or poor implementation of a biosecurity measure, a **first report** is prepared **explaining the importance of the correct implementation** of each biosecurity measure and **recommending different corrective measures to minimise the risks**. Although the farmers receive the advice in the written report, **recommendations and advice are given to the farmers during the visit at the same time as the audit is carried out.**

BIOPON PROGRAMME



Figure 2: Report model

This report is only a model, they are not real results, they are fictitious.

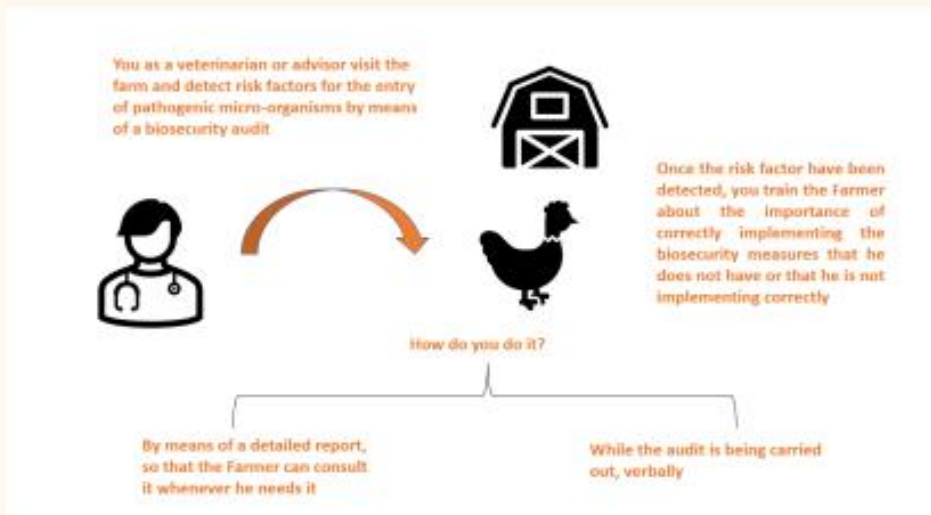


Figure 3: Summary of steps

BIOPON PROGRAMME

3

When the audits of the other farmers that you advise in the region are finished, the **average of the region is calculated** and each farmer receives a **second report with a scatter plot** showing graphically whether the farmer's biosecurity score is below, equal to or above the average.

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- (E) Laboratorio Inscrito en el Catálogo de Laboratorios de Salud Pública de la Consejería de Sanitat de la Generalitat Valenciana
- (E) Laboratorio Certificado ISO 9001 con nº EC-3844028
- (G) Laboratorio Oficial para el Control de Trichinella en la Comunidad Valenciana
- (G) Autorización AN080 y Reconocimiento de Acreditación B0589 por la Consejería de Sanidad y Política Social de la Región de Murcia
- (G) Centro habilitado por el Ministerio de Ciencia e Innovación para realizar pruebas PCR de SARS-CoV-2



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This scatter plot is only a model, they are not real results, they are fictitious.

Video about
Biopon
Programme
in Spain [here](#)



Podcast about
Biopon
Programme in
Spain [here](#)



For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>


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Video about Biopon Programme in Spain [here](#)
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4.11 Theoretical/practical courses on biosecurity for farmers.



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THEORETICAL/PRACTICAL COURSES ON BIOSECURITY FOR FARMERS



MAIN KEY POINTS

- Important for farmers to know the importance of applying biosecurity measures and how to implement them correctly
- Theoretical part of the course.
- Practical part of the course.

A good approach to motivate and raise awareness in farmers to implement the correct biosecurity protocols in their farms is the implementation of **theoretical/practical courses**. In the Valencian region (Spain) These courses are given by veterinarians in person in the facilities of the Centre for Poultry Quality and Animal Feed of the Valencian Community (**CECAV**, in Spanish).

Most of the courses are focused on biosecurity measures to prevent the entrance of pathogenic agents (**Cleaning and Disinfection Courses, Animal Welfare or Prevention and Salmonella Control Measures Courses**). In addition, courses aiming the main alternative measures for the control of these pathogens, such as the use of **phage therapy**, are given.

How do these courses take place?

- 1** Where?
- 2** Theoretical part
- 3** Practical part

THEORETICAL/PRACTICAL COURSES ON BIOSECURITY FOR FARMERS

1

These courses are given by veterinarians in person in the facilities of the Centre for Poultry Quality and Animal Feed of the Valencian Community (**CECAV**, in Spanish). depending on the type of courses, they bring together farmers only from the meat sector (broilers and turkeys) or from the laying sector or they bring together all types of farmers (cleaning and disinfection course). The number of farmers attending is limited to 20. In the case of courses for the broiler sector, all farmers belong to the same integrator.



Figure 1: Room where the courses are held


Theoretical/practical courses video [here](#)



2


The **theoretical part of the courses** consists of explanations by different lecturers experts in each specific subject with emphasis on the importance of applying biosecurity measures and how to implement them correctly. These lecturers experts are supported by with videos, photos. **You as a lecturer may include for example pictures of mass cullings due to outbreaks of avian influenza to make farmers aware to be careful if they don't want their animals to suffer the same!!**


4.12 On-site assistance farm veterinarian.




ON-SITE ASSISTANCE FARM VETERINARIAN

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MAIN KEY POINTS


- Important for farmers to have a trusted veterinarian for advice them on biosecurity
- The veterinarian advises in case of Government audit, entry of pathogens and routine control.

It is important that all poultry farmers; broilers, turkeys, breeders, laying hens and ducks have a **trusted veterinarian**. In Spain, This professional, as well as advising on animal management, welfare, production rates, health programme (vaccinations, deworming and treatments), and carrying out sampling and preparation of documentation, also **advises on biosecurity**.

Advice from the farm veterinarian on the **correct implementation or use of biosecurity measures** is a good tool to help farmers in particular in the following cases:


1

Government audit




2

Entry of pathogens



3

Routine control



ON-SITE ASSISTANCE FARM VETERINARIAN

1



After detection of non-conformities following a **government biosecurity audit**. The veterinarian advises on the best way to remedy the non-compliance and in case it is at documentary level, helps in the drafting of these documents. **try to explain well to the farmer why the official veterinarian has written this non-compliance if they have not done so much. More than an imposition of the law, it should be an opportunity to prevent pathogenic micro-organisms from entering the farm!**

2



After the entry into the farm of **pathogenic micro-organisms of animal health (*Mycoplasma*) and public health (*Salmonella*)** importance. The veterinarian studies the possible route of entry and advises the farmer on a series of corrective biosecurity measures to prevent it happening again or spreading to other poultry houses. **Always try to explain to the farmer well the reason and justification for corrective actions taken!**

3



During **routine control visits to the farm**. The veterinarian advises the farmer in case he detects any risk factor that can be mitigated with the implementation of any biosecurity measure. **Even if you go to the farm a lot, always try to pay attention to the condition of biosecurity measures on the farm and if you detect any deficiencies, report them to the farmer!**

For more information:


- NETPOULSAFE project : <https://www.netpoulsafe.eu>



"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe)."


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4.13 Individual coaching for the specific difficulties of direct selling farms.




INDIVIDUAL COACHING FOR THE SPECIFIC DIFFICULTIES OF DIRECT SELLING FARMS

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KEY POINTS

- Short-run farms have varying levels of health and technical support, with complex production systems.
- The individual coaching tested on French direct selling farms seems to be an effective measure.
- This coaching method could be disseminated to all advisers for a wider impact.


Direct selling farms : production systems often complex



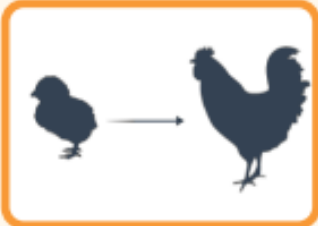
Free-range



Multi-species



Multi-ages



INDIVIDUAL COACHING FOR THE SPECIFIC DIFFICULTIES OF DIRECT SELLING FARMS

- Such diverse systems make it difficult to apply **biosecurity standards** in the field.
- Direct selling farms have varying levels of **technical and sanitary supervision**: the presence of a technician and the degree of specialisation in poultry differs depending on the region...

→ Applying biosecurity is all the more difficult !

Results of coaching in direct selling farms

The individual coachings were led in Brittany and Center regions, France.

1. The main challenges in complying with biosecurity standards

- Raising awareness of biosecurity among farmers
- Setting up hygiene locks
- Delimiting zones



2. Well-thought-out and implemented solutions

Installation a farm hygiene lock



Partial enclosure of the production zone



Installation of a lime foot bath



3. Satisfied farmers !



"Imagining changes is more difficult than implementing them, I'm delighted with the result!"

INDIVIDUAL COACHING FOR THE SPECIFIC DIFFICULTIES OF DIRECT SELLING FARMS

An efficient supporting measure

What are the prerequisites for effective coaching?

- Putting the farmer at the **centre of the improvement process**
 ↪ Long term motivation
- Sharing **knowledge and ideas** with the farmers and their employees
 ↪ Operational solutions that can be realised on the farm



How can the use of individual coaching be extended?

- Disseminating this method to **all the advisers** who work with these farmers
- Creating a network for **sharing solutions found and tested** in different configurations

Find out in detail how to carry out coaching and use a biosecurity level assessment tool :



Coaching methodology



The Biocheck.Ugent tool



Discussion between 2 coaching experts

For more information :

[Guide de biosécurité en circuit-court \(en Français\)](#)



Icons designed by Freepik and BioRender.


This project was funded by the European Union's Horizon 2020 research and innovation programme under grant agreement no. 101000728 (NetPoulSafe).




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[Guide de biosécurité en circuit-court \(en Français\)](#)


4.14 Using videos for dissemination of information to visitors or farmers.



USING VIDEOS FOR DISSEMINATION OF INFORMATION TO VISITORS OR FARMERS








KEY POINTS

- Dissemination of scientific/technical information to farmers/visitors.
- Short videos present many advantages.
- We propose a framework + some tips to prepare and use the videos.

Why audio-visual material?


- More **appealing** than a simple text/report
- Makes information more **visual/real** → **more impact**
- Possibility to reach a **wide public** (adapted to web dissemination)



Framework for preparing videos


1

Define objectives + **key messages**



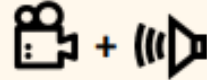
2

Write a **detailed** scenario = spoken text + videos parts + music/sound effects




3

Gather/record your videos/sounds



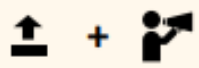
4

Video editing



5

Upload/disseminate



USING VIDEOS FOR DISSEMINATION OF INFORMATION TO VISITORS OR FARMERS

Write a **detailed** scenario = spoken text + videos parts + music/sound effects



- Use a table or a detailed text. →
- Keep it **short!**
- Don't forget to present yourself / your organization and the people who talk (orally or using subtitles).

Video recording



- Do several takes, try having multiple angles or frames for interviews
- Find or record videos of the **farm** (top view, panorama...) or the interviewed person **when he/she works**



Sound recording



- Record if possible all interviews in the **same environment** (same background noise throughout the video)
- **Alternate** interview and voice-over
- Sound-effects may add dynamism (**do not overuse them**)
- A (discrete) **background music** may facilitate transitions or be used for descriptive visual parts
- Voice-over: **do not read the text as you write it**, make it sound natural and fluent.



USING VIDEOS FOR DISSEMINATION OF INFORMATION TO VISITORS OR FARMERS

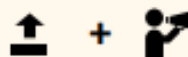
Video editing



- A **wide choice** of editing softwares is available, from professional to free softwares (including intuitive ones)
- Add **images or text boxes** to create useful and easy “special effects”
- Transition special effects : keep it simple !
- **Keep frames short**, even in a long interview (use farm videos, change the angle ...)
- Thing about adding subtitles



Upload/disseminate



- Think about the **availability/visibility** (public search, restricted to users who have the link ...)
- Different **platforms** are available for uploading/storing/accessing
- Make it easy to disseminate : provide links, QR codes ...

In a nutshell:

- Define well your goals and key messages
- Maintain a dynamic & short video
- Prepare your dissemination strategy
- Ask for the support of professionals if you feel uncomfortable with technical aspects

For more information:

- [NETPOULSAFE YouTube Channel](#)
- NETPOULSAFE project : <https://www.netpoulsafe.eu>




This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe)

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[NETPOULSAFE YouTube Channel](#)

4.15 training/workshop for poultry workers during coaching.



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TRAINING/WORKSHOP FOR POULTRY WORKERS DURING COACHING



MAIN KEY POINTS

- Course/workshop helps raise biosecurity awareness among workers
- Creating an atmosphere of discussion between the manager and the workers with the ultimate aim of improving the biosecurity of the farm.

It is recommended that, on farms with a considerable number of workers, after the conventional coaching of the farm manager (farmer), an **interactive training/workshop with the participation of the workers involved in biosecurity** on the farm, as well as the farm owner, should be held.

The **training/workshop** of approximately 1 hour duration consists of:

- 1 CONCEPT AND IMPORTANCE OF BIOSECURITY
- 2 BIOSECURITY MEASURES
- 3 NEW BIOSECURITY MEASURES

TRAINING/WORKSHOP FOR POULTRY WORKERS DURING COACHING

1

CONCEPT AND IMPORTANCE OF BIOSECURITY

A brief overview of the concept of biosecurity stressing its importance, emphasising the consequences for:

-**Food safety:** showing for example *Salmonella*, intoxications and showing the relation between farm biosecurity and human cases of Salmonellosis.

-**Public health:** showing examples of the consequences of antibiotic resistant bacteria and a possible pandemic caused by a mutation of Avian Influenza.

-**Farm economics.** showing pictures of high mortalities due to the introduction of Avian Influenza on the farm, as well as explaining the repercussions of the introduction of avian pathogens on the production and economics of the farm.



TRAINING/WORKSHOP FOR POULTRY WORKERS DURING COACHING

2

BIOSECURITY MEASURES

A review of the basic:

-**External biosecurity measures:** hygienic access for personnel and vehicles, manure and carcass management, etc.)

-**Internal biosecurity measures:** House Hygiene Lock: clothing, footwear, hand disinfection, specific materials for each house, as well as correct cleaning and disinfection



TRAINING/WORKSHOP FOR POULTRY WORKERS DURING COACHING

3

NEW BIOSECURITY MEASURES



An explanation of the **new biosecurity measures to be implemented on the farm** (having agreed the action plan with the farmer beforehand), stressing their importance and also how to use them correctly.

As the owner of the farm also participates in the workshop, some of the **employees can suggest some improvements or ways to implement the measures** (thus participating in the coaching), creating an **atmosphere of discussion between the manager and the workers** with the ultimate aim of improving the biosecurity of the farm.

The coaching coupled with the **interactive training/workshop for the workers** can be a great help to **detect risk factors** for pathogen entry from farms, to **help implement improvements** and to **increase the awareness** of both the farmer and all his employees.

Video about Coaching in Spain [here](#)



Podcast about Coaching in Spain [here](#)



For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>



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-Video about Coaching in Spain [here](#)
-Podcast about Coaching in Spain [here](#)

5 Supporting measures for farmers and advisors.

5.1 coaching experiences in Italy: how do you do in an integrated poultry production system.



COACHING EXPERIENCES IN ITALY: HOW DO YOU DO IN AN INTEGRATED POULTRY PRODUCTION SYSTEM?







MAIN KEY POINTS

- Farmer's coaching
- Group team-work towards an improvement plan
- How to structure in an integrated poultry production system

1 What

- Supporting measure for biosecurity improvement
- Ideally a **round table discussion** with the most relevant people of the farm



- Make sure that the farmer identifies an **improvement plan**



Scan here for more information on this methodology!



2 When

- Need to identify a **long-term oriented** solution
- Need to find **alternative solutions** to the common "advising"

DO'S DON'T

3 Where

- Any place **comfortable** for the people involved

 **Think biosecure!**
 You are going to gather different people in the same place.
 Better not in the farm area!



COACHING EXPERIENCES IN ITALY: HOW TO DO IN AN INTEGRATED POULTRY PRODUCTION SYSTEM

4 Who-How

- Make sure you involve the **right people** in the discussion. The goal is to make the farmer identify the problems on his/her own and make him/her reach a solution!

The perfect discussion-team recipe:

- the **farmer**
- the **coach** → scan the QR code for more information
- one or more **integrated company representative** (e.g., veterinarian, technician, etc.)
- Any other **person** you deem **relevant for the farm** environment (e.g., farm workers, feed advisors, official veterinarians, etc.)



- **Start** by assessing the farm situation
- **End** by identifying a plan which is **Smart Measurable Acceptable Realistic Time-bound (SMART)**
- **Follow up** with the approach: **Plan-Do-Check-Act (PDCA)**

Want to know more on how to organise your discussion? [Scan here](#)



COACHING EXPERIENCES IN ITALY: HOW TO DO IN AN INTEGRATED POULTRY PRODUCTION SYSTEM

5 Why

- Coaching sessions as **discussion** aimed at helping the farmer to find biosecurity gaps and improvement plans is not common
- The strength of this methodology is the **different point of views/ approaches towards the problems** different stakeholder can have



- The **farmer** (or related figures) is the **main actor**. As being dependent on the company, (s)he has limited decision-making power. A representative from the integrated company is needed during the discussions
- This methodology is applicable to **any topic**, regardless the productive category

6 Tips

As a coach...

As a participant...

No one is here to judge!

- ✓ Do not let anyone judge or make uncomfortable comments
- ✓ Be as much honest as possible

Everyone counts!

- ✓ Make sure everyone is able to give his/her input
- ✓ Make sure you are not hogging the spotlight

For more information:

- [Click here for more information on the coach/coaching onset!](#)
- [Click here for more information on the coach/coaching onset! VIDEO](#)
- [Click here for more information on poultry production in Italy!](#)
- [Click here for more information on the SMART and PDCA approach!](#)
- NETPOULSAFE project: <https://www.netpoulsafe.eu>


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- [Click here for more information on the coach/coaching onset!](#)
- [Click here for more information on the coach/coaching onset! VIDEO](#)
- [Click here for more information on poultry production in Italy!](#)
- [Click here for more information on the SMART and PDCA approach!](#)


5.2 virtual farm tour as an alternative to physical farm tour.




**VIRTUAL FARM TOUR AS AN ALTERNATIVE TO
PHYSICAL FARM TOUR**

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MAIN KEY POINTS

- Avoidance as best biosecurity measure
- Virtual visit as alternative for physical visits
- Importance of sharing different practices

What is a virtual farm tour?

As suggested by the name, a **virtual farm tour** is a farm tour carried out through a video or live footage of real situations of different farms

It represents a more “biosecure” alternative to the on-site visits and it could be extended to different topics

You will only need to:

1. **Set an objective** → What would you like to achieve with the virtual farm tour?
2. **Create your own video** → For technical stuff, see next page. As for the rest... be creative!
3. **Choose your audience** → Choose wisely and always remember your final objective!
4. **Start!**


Why a virtual farm tour?

As an additional cue to implement biosecurity measures, many farmers argue that seeing other farms and their biosecurity measures is definitely useful

↓

The most straightforward way to implement such **supporting measure** is to physically visit a farm to see and discuss what other farmers do in their farms

↓

 **Think *biosecure!*** If you are going to gather different people in the same place, better not in the farm area!

VIRTUAL FARM TOUR AS ALTERNATIVE TO THE PHYSICAL FARM TOUR

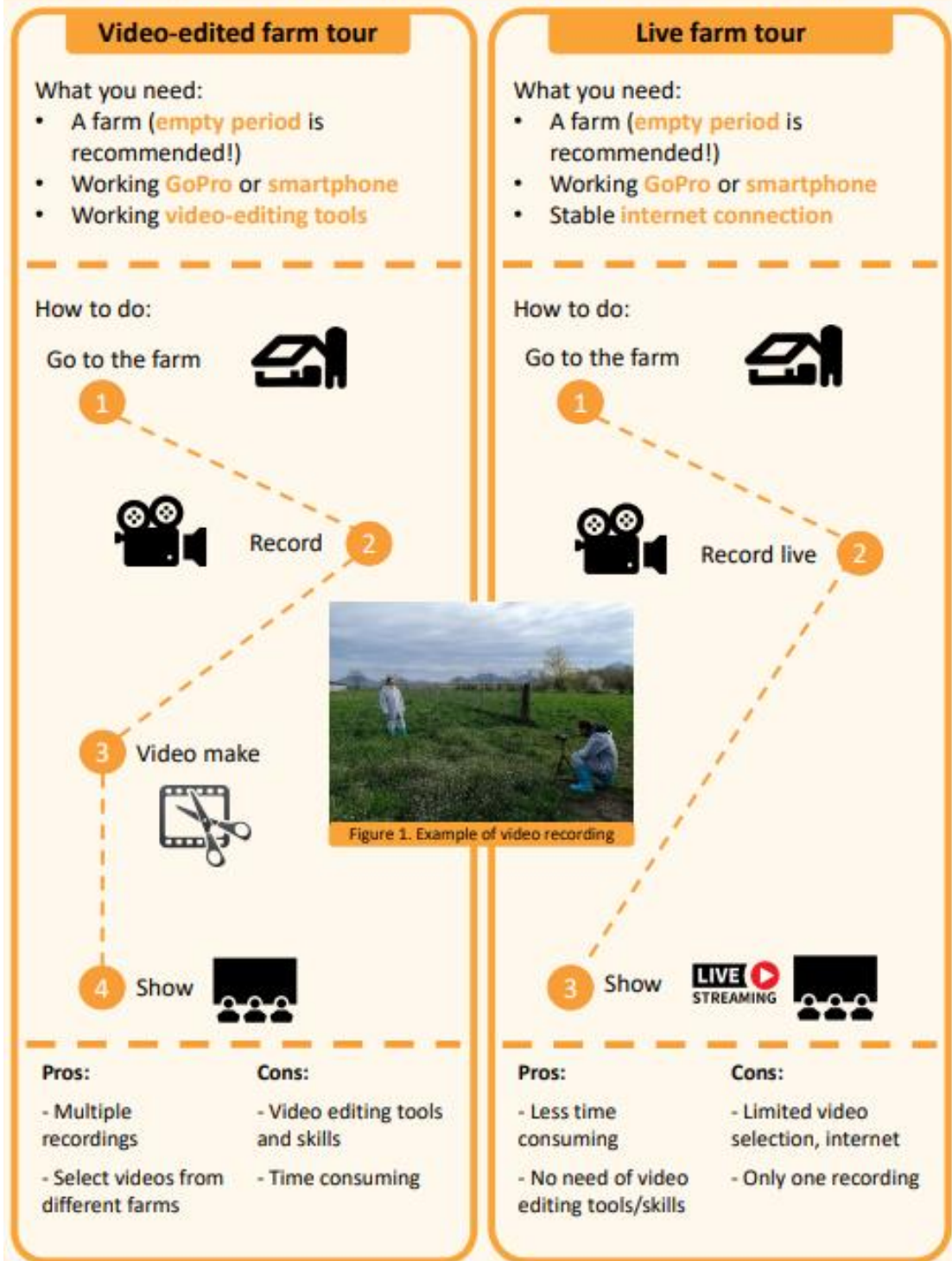


Figure 1. Example of video recording

VIRTUAL FARM TOUR AS ALTERNATIVE TO THE PHYSICAL FARM TOUR


What's next?

Considering the purposes of the video (either video-made or live streaming), the following steps are **watch it** and **comment it** with a group of farmers

Where

- ❖ **Rooms** large enough to hold many people and possibly provided with a big screen (and with internet connection, if needed). As alternative to the big screen, a laptop should be fine



 **Think *biosecure!*** If you are going to record a video inside a farm, remember the basic biosecurity rules even while filming!

Who

- ❖ **Moderator**, to facilitate the discussion among the people present
- ❖ **Audience**, namely farmers but also any other relevant person fitting the original objective
- ❖ **External experts**, according to the topic. Great help and support for the discussion!



Tip: gather separately audience with the same interest

How

- ❖ The moderator should make sure to **involve all the participants** and let the **discuss** flow also **among them**
- ❖ Bear in mind the **original objective**. Then, you can shape your discussion accordingly (*i.e.*, watch only the video, make also a presentation, etc.)



Tip: make participants proactive by asking questions directly on the video displayed!

For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>
- [Click here to access an e-learning course on biosecurity in poultry production!](#)


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).




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[Click here to access an e-learning course on biosecurity in poultry production!](#)


5.3 live workshops as a supporting measure for the implementation of farm biosecurity.



LIVE WORKSHOPS AS A SUPPORTING MEASURE FOR THE IMPLEMENTATION OF FARM BIOSECURITY








MAIN KEY POINTS

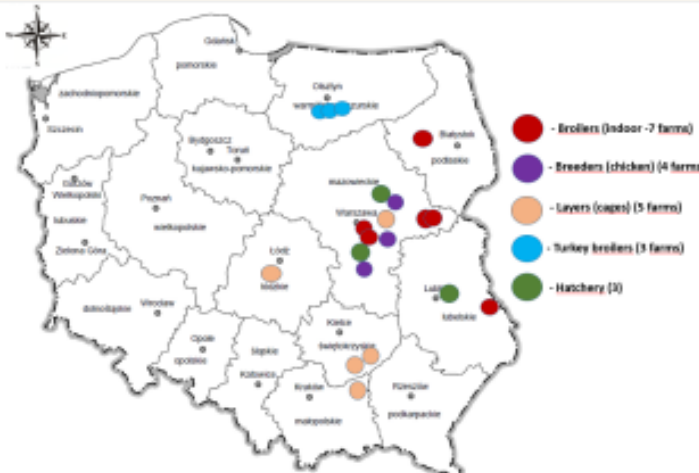
- Implementation of supporting measures (SM) for biosecurity compliance in poultry farming.
- Biosecurity training - live workshop as a effective SM.

Biosecurity training - live workshop refers to a supporting measure (SM), that is used to demonstrate any particular subject, exchange ideas and problem-solving, which improve the skill set and raise motivation, awareness, and knowledge of Stakeholders.



This supporting measure was evaluated on 20 Pilot Farms (PF) in Poland.

Farm owners, managers, and advisors from different productions: broilers, layers, breeders, turkeys, and hatcheries joined the 1-day in-person training managed by Network Facilitator at WULS (6 hours).



LIVE WORKSHOPS AS A SUPPORTING MEASURE FOR THE IMPLEMENTATION OF FARM BIOSECURITY

The following topics were presented by invited Specialists in the field of biosecurity and discussed with the audience:

- external and internal biosecurity on poultry farms and hatcheries,
- law regulations,
- Biocheck.UGent® scoring system.

At the end, all participants had to take a short single-choice test, and they received the certificate, and the materials (in paper) from the course.



Fig. Lecture room and audience during the training

After some time (at least 6 months), the participants were asked if it was easier for them to implement the biosecurity measures after following the implementation of the SM.



In their opinion 'this SM was helpful and many aspects of biosecurity become more clear', 'it should be annual and more topics should be presented and discussed', 'it was much easier to rethink and find gaps in the biosecurity on farm or company', 'discussion with professionals and sharing the experiences with other stakeholders gave a trust that implementation of practices will bring benefits'.

They validated this SM in a scale of 1-5: 20% of PF graded it as '5'; 30% as '4'; and 10% as '3'. In the opinion of 10% of PF, it was difficult to evaluate, since only small changes in biosecurity were done, and 30% did not implement any new measure.

For more information:

- NETPOULSAFE project: <https://www.netpoulsafe.eu>

The NetPoulSafe project, is funded by the EU Research and Innovation Programme Horizon 2020 under Grant Agreement n. 101000728



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5.4 postcard for hobby poultry farmers in times of avian influenza



POSTCARD FOR HOBBY POULTRY FARMERS IN TIMES OF AVIAN INFLUENZA

NetPoulSafe








MAIN KEY POINTS

- In times of high disease pressure (e.g. Avian Influenza), it is important for hobby poultry farmers to be informed about the dangers of pathogens.
- The postcard contains a checklist for hobby poultry farmers to properly house their animals. All farmers and advisors can use the postcard to inform people.
- When in times of Avian Influenza it is seen that hobby poultry is not housed in a protected way, the postcard can be put in the mailbox to anonymously address the hobby poultry farmer about this.

[Click here](#) to download the postcard.

Hey hobby poultry farmer,
How do you keep your chickens healthy?



It's not as simple



That's because our owner takes good care of us.

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In Europe we are dealing with the highly contagious bird flu virus. Most of the wild birds in Europe are carriers of the virus. Because (flocks of) wild birds can come into contact with your chickens, there is a high risk that your chickens will become infected with bird flu. If your chickens become infected with the virus, they will almost certainly die.

Checklist: protect your chickens!

- ☑ Keep hobby poultry in an enclosed cage, coop, or bring the animals inside.
- ☑ Also cover the net or cage at the top so that wild birds cannot come in contact with your poultry.
- ☑ Make sure the top is completely closed so that holes from wild birds cannot come in contact with your poultry.



NetPoulSafe



Scan the QR code for more information



More information:
- NETPOULSAFE project : <https://www.netpoulsafe.eu>

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).




NetPoulSafe

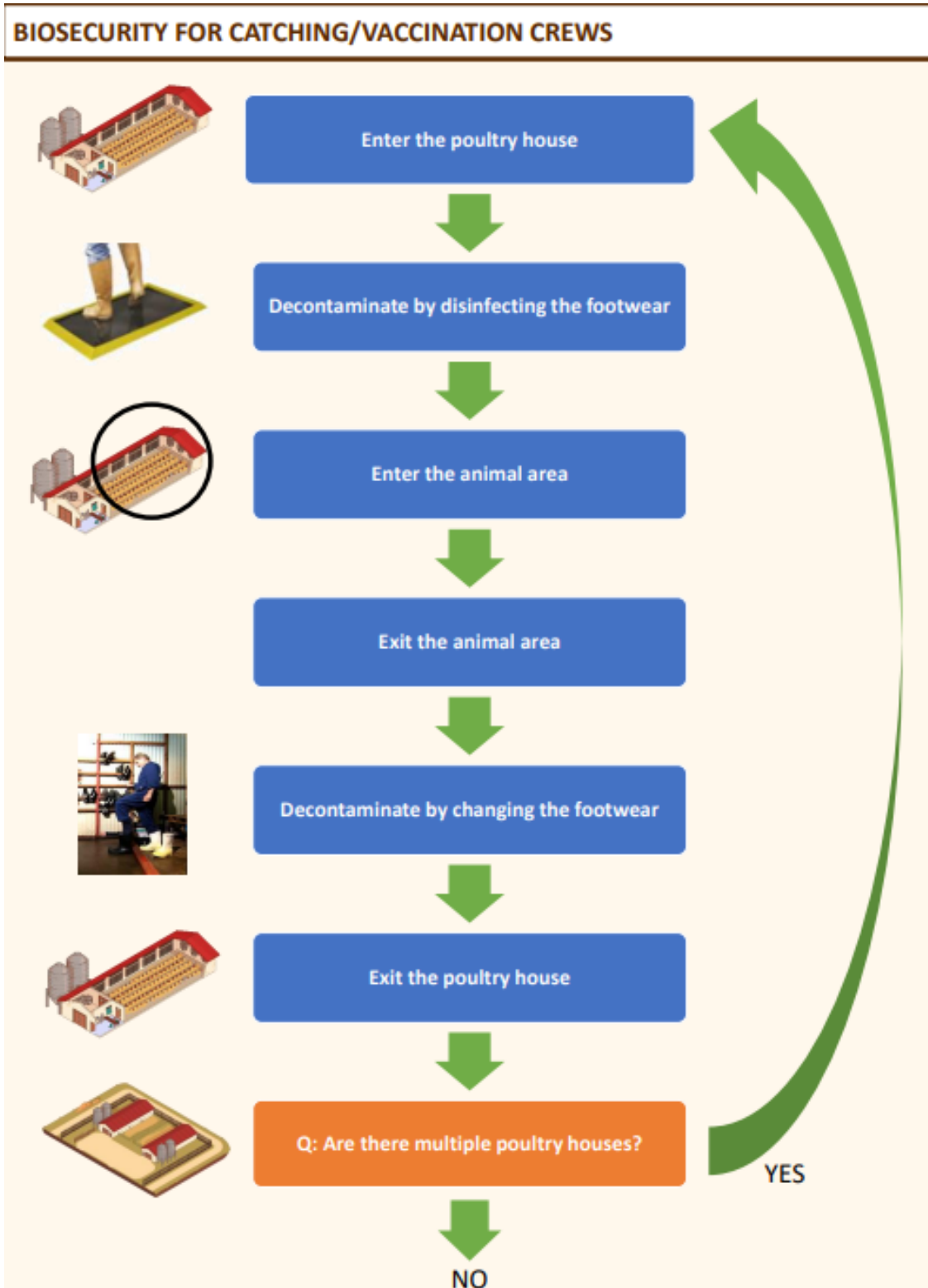
Postcard:

https://www.netpoulsafe.eu/wpcontent/uploads/2023/09/NL7_Postcardfinal_EG.pdf

6 Factsheets explaining how to correctly implement successful Biosecurity measures for farmers.

6.1 Biosecurity for catching/vaccination crews.






BIOSECURITY FOR CATCHING/VACCINATION CREWS



[Click here to access an e-learning course on biosecurity in poultry production](#)


6.2 Water management and sanitation -sampling strategies.



WATER MANAGEMENT AND SANITATION -SAMPLING STRATEGIES







MAIN KEY POINTS

- Water is a crucial nutrient, and poor water quality and quantity will have a negative impact on production performance.
- Good water management involves providing safe drinking water

For infections to enter poultry facilities, the distribution system or water itself is a route.




When should I test the water?



When you notice changes in the color of the water.

When there is foul smell from the water.






Persistent poor flock performance

Recent flooding near the water source

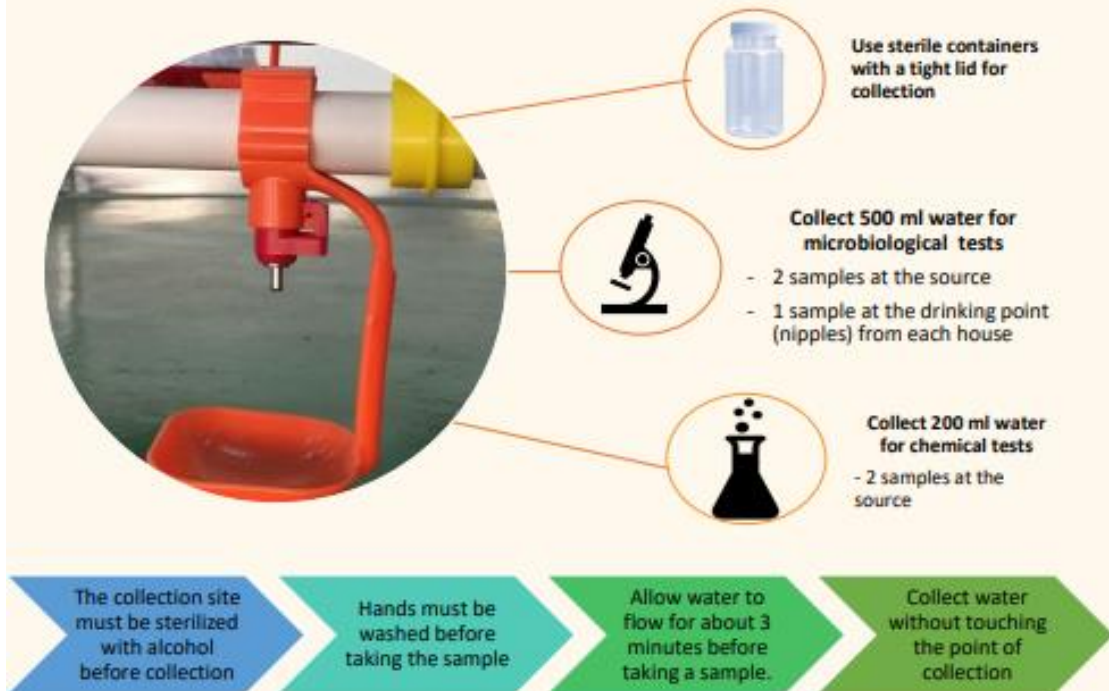




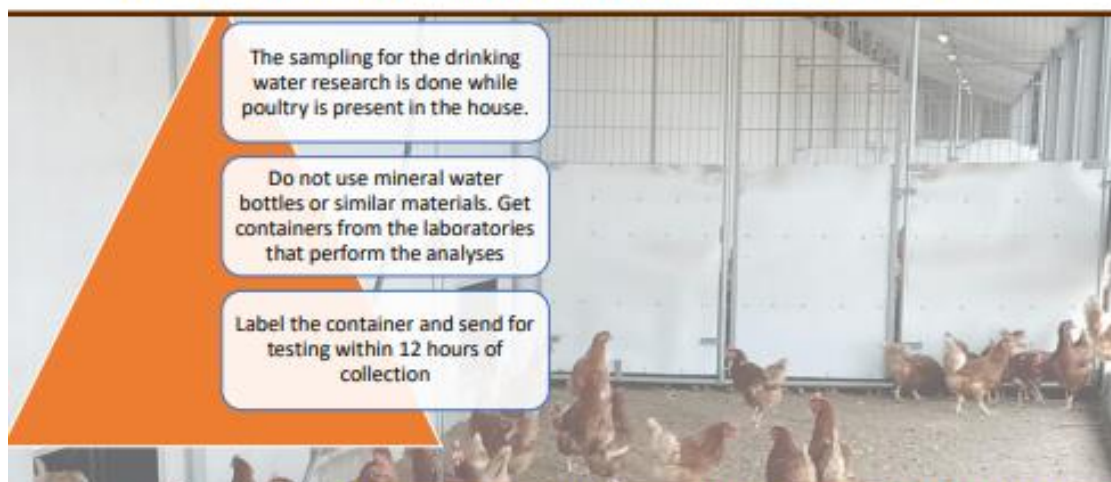
Loss of pressure in water system.

WATER MANAGEMENT AND SANITATION - SAMPLING STRATEGIES

Monitoring with drip and swab sampling techniques



WATER MANAGEMENT AND SANITATION SAMPLING STRATEGIES



The sampling for the drinking water research is done while poultry is present in the house.

Do not use mineral water bottles or similar materials. Get containers from the laboratories that perform the analyses

Label the container and send for testing within 12 hours of collection

Mineral deposition is a greater challenge and has the following effects on water:

Why should I do a chemical analysis?



Promotes the growth of microorganisms



Forms viscous gelatinous clumps



Lowers pipe volume



Clogs drinkers



Causes scaling in pipelines



Affects hardness of water



Changes the smell e.g., rotten egg smell by excess sulfur



Water discoloration e.g., Iron turns water RED

For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>
- Video water quality: <https://www.youtube.com/watch?v=ufUPSik29Qg&t=67s>



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6.3 Ways to reduce the risks associated with vehicles visiting the farm.



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WAYS TO REDUCE THE RISKS ASSOCIATED WITH VEHICLES VISITING THE FARM



MAIN KEY POINTS

- Vehicles from different sources and purposes are a risk for disease transmission as they visit several poultry farms on a day-to-day basis.
- These include, suppliers of feed, live poultry transport, egg collection, rendering trucks and vehicles of visitors

Vehicles should not be permitted to enter the site.



1

2

Restrict access for outside service providers (e.g. dead bird/waste collectors). Place the carcass container far from the poultry houses and near the road.

WAYS TO REDUCE THE RISKS ASSOCIATED WITH VEHICLES VISITING THE FARM

3

Clearly differentiated farm zones (clean route and dirty route) will limit entry of unauthorized and potentially harmful vehicles.



4

Vehicles entering the facility can be sanitized by a disinfection arch. Upon arrival, vehicles can be disinfected with wheel dips, mats, or sprays.



Surface disinfection by spraying for complete coverage (the sides, the top, the front, the rear, the chassis) of all sized vehicles

Built-in spray nozzles for tire disinfection



WAYS TO REDUCE THE RISKS ASSOCIATED WITH VEHICLES VISITING THE FARM
Vehicle-associated biosecurity risk assessment guide

	Minimal risk	Medium risk	High risk
Vehicle Entry and Disinfection	Having a vehicle disinfection station with high pressure sprayer at the gate for all vehicles	Inadequate vehicle disinfection station	No vehicle disinfection station or used only occasionally
Rendering truck	never enter the premises, but collect from bins outside perimeter fence or through the dirty route	collect from bins inside perimeter fence	collect from bins near poultry houses
Garbage truck	Garbage pick-up is outside the perimeter fence or through the dirty route	Garbage pick-up is inside the perimeter near the gate and tires are sanitized	Garbage pick-up is inside the perimeter near the poultry holding
Manure truck	Never goes from one poultry farm to another on the same day. At the farm entrance and exit, the undercarriage and tires are sanitized	Never goes from one poultry farm to another on the same day. But also, never sanitized on arrival.	Visit multiple farms on the same day and never sanitized on arrival.
Egg transport truck	Automatic disinfection arch before entering. Full wash after picking up eggs.	Manual wash after collecting eggs	Never washed after collection.
Feed delivery truck	Feed truck delivers feed from outside the perimeter or through the dirty route.	Feed truck goes on-farm to deliver feed	Feed truck goes on-farm to deliver feed and must access the poultry house(s)
Chick delivery truck	Automatic disinfection arch before entering. Full wash after delivering .	Manual wash after chick deliveries	Never washed after a delivery

For more information:


- NETPOULSAFE project : <https://www.netpoulsafe.eu>



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6.4 Preventing cross-contamination in multi-species livestock farms.




PREVENTING CROSS-CONTAMINATION IN MULTI-SPECIES LIVESTOCK FARMS

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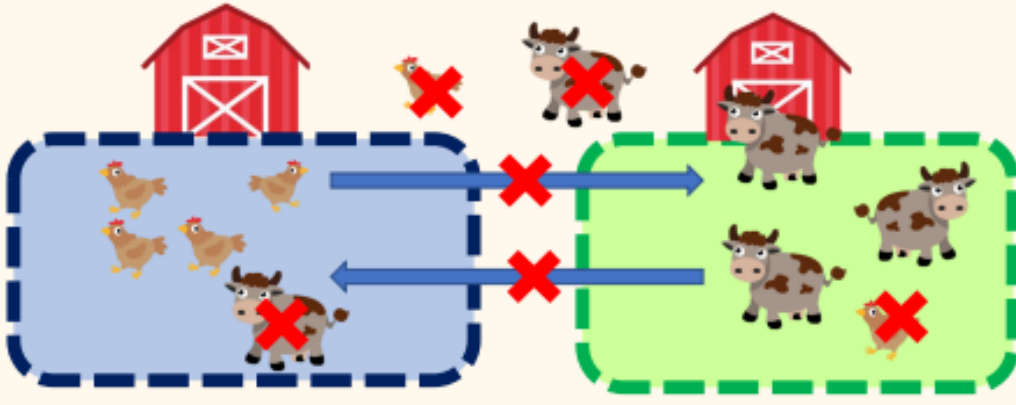


MAIN KEY POINTS

- Many pathogens, harmful for animals or causing foodborne diseases, can be shed by farm animals. Farm animals can present clinical (visible) symptoms or shed the pathogens without presenting visible symptoms.
- When several species are kept in the farm, biosecurity levels need to be high for all species.
- For each species, animal movements have to be controlled to avoid cross contaminations. When impossible, the risk should be mitigated by applying stricter cleaning and disinfection measures.

“Birds of a feather flock together!”

- *Closed pens prevent animals from leaving the green zone (clean area)*
- *Keep separate pastures/ranges for each species (e.g. no cattle, sheep or goat should grazing on poultry outdoor ranges)*



PREVENTING CROSS-CONTAMINATION IN MULTI-SPECIES LIVESTOCK FARMS

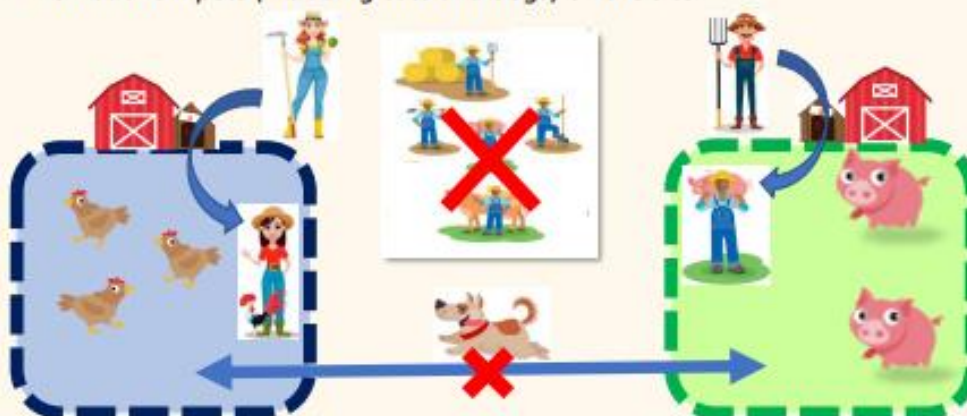
Careful manure management

- Do not store manure on the poultry outdoor ranges
- Do not use manure as a fertilizer without previous treatment (e.g., composting), especially on crops that may be used to feed other animal productions
- When possible, do not share between species material used to handle manure
- If you use shared material, cleaning and disinfection must be performed on dedicated areas that can be cleaned easily and where contaminated cleaning water can be collected for treatment.
- Properly manage contaminated water



No uncontrolled movements

- If possible, dedicate workers to each species
- Use different clothes for each species (footwear, coveralls, gloves, headgears)
- Efficient hygiene locks: make their access compulsory and make them easy to use
- Do not allow pets (including cats and dogs) on the site



For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>
- [An explanatory video on preventing cross-contamination](#)


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[An explanatory video on preventing cross-contamination](#)

6.5 Tips for a better use of the hygiene lock.



TIPS FOR A BETTER USE OF THE HYGIENE LOCK



KEY POINTS


- Biosecurity management relies on two main pillars : structural features (equipment, premises) and easy-to-implement practices.
- Entering the poultry house, as a critical point for pathogens introduction in the farm, is a good example of this comprehensive approach.
- Hygiene lock design is a key point for efficacy and sustainable application of crucial sanitary measures.
- Simple, comfortable and intuitive routine procedures are requested to achieve high compliance.
- In addition of the tips presented here, regular advices, training sessions, posters or podcasts are useful to support poultry farmers in setting-up a sustainable hygiene lock routine

Structure of the hygiene lock

Hygiene locks are mandatory at the entrance of each production unit, whether or not there is an outdoor access.

It includes at least 2 zones and ideally a 3rd :

- 1 – a dirty area: outside / remove plain clothes
- 2 – a clean area: inside / put on work clothes
- 3 – an intermediate used for washing and disinfection



TIPS FOR A BETTER USE OF THE HYGIENE LOCK

Always keep it tidy and clean

- Dedicated usage = only for sanitary purposes
- Do not use it as a storage place for equipment, even less for dead animals! Dead birds should be transported through a dedicated trapdoor in the wall or via a closed bucket.
- Prevent rodents or insects from getting inside
- Get organized to keep the hygiene lock clean from the animal areas (e.g. have extra dedicated shoes to walk on the litter)
- A good indication of proper hand washing is the state of the sink: clean and free of any material if it is regularly used.



Work organization and limited movements

- Adjust practices to limit the number of crossing.
- Whenever possible, place the computers, bins and everything related to water and electricity in the dirty area.
- Use monitoring systems via mobile phones
- Windows in the dirty area make it possible to check the poultry in the building without going inside.



TIPS FOR A BETTER USE OF THE HYGIENE LOCK

Apply the same rules all the time and for everybody

- Be careful with habits, deviances or emergency situations: “just” checking the computers, “just” taking a piece of paper, “just” having a quick look at the birds when the alarm rings.
- For multispecies farm (e.g. with swine or cattle): be aware of risks of cross contaminations.

Make it easier for everybody to apply the rules

- It is easier to comply with the hygiene lock procedures when there is a bench (to avoid the risk of falling when removing the shoes and boots) and a boot jack.
- Comfortable room temperature, hot water, bactericidal soap, clean coat racks.
- You can use duckboard to delimitate the clean and dirty areas and have a clean floor to walk on with socks.



For more information:

- Podcast : https://www.youtube.com/watch?v=JJDf33_WyP8

- NETPOULSAFE project : <https://www.netpoulsafe.eu>


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Podcast : https://www.youtube.com/watch?v=JJDf33_WyP8

6.6 how to safely store disinfectants on a poultry farm?



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HOW TO SAFELY STORE DISINFECTANTS ON A POULTRY FARM?




MAIN KEY POINTS:

- All disinfectants used on poultry farms are potentially dangerous for the health of people, birds, and the environment.
- Appropriate use and storing of disinfectant on farm is crucial

- Training of persons responsible for the proper use and storage of disinfectants is necessary, as well as wearing protective clothing, goggles, masks, and gloves during handling.
- The instructions on the label and the safety data sheet of the products provided by the manufacturer have to be followed.



Disinfectants should be stored in a dedicated locked storage room at a controlled temperature, and not exposed to extreme environmental conditions.



HOW TO SAFELY STORE DISINFECTANTS ON A POULTRY FARM?

- The room should be dry, preferably cooled (temperature range 4°C - 30°C), and not exposed to direct sunlight. These products can be also stored in dedicated locked cabinets located outside the production zone.
- For nonflammable, corrosion-resistant, and fire-resistant cabinets and shelves should be used for aggressive disinfectants (acids or alkalis) and flammable agents, respectively.
- The products have to be stored in original containers on dedicated shelves and below eye level.
- Pouring disinfectants into other containers with different labels, mixing them with other products, or store in unlabeled containers is forbidden.



- The harmful substances from disinfectants after the expiration date can turn into chemical mixtures that can be hazardous to human health.
- Open packages of dry disinfectants should be secured to prevent moisture ingress.
- Empty containers of disinfectants have to be properly handled. Detailed records of the purchase and the use of disinfectants are required.




For more information:

- NETPOULSAFE project: <https://www.netpoulsafe.eu>





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6.7 create your farm-specific hygiene protocol.



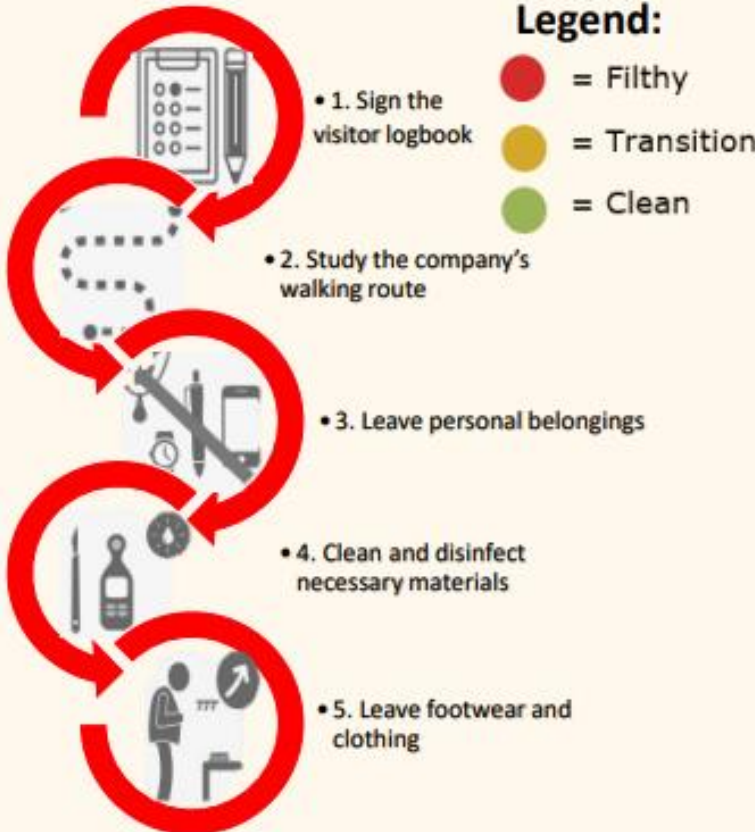
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CREATE YOUR FARM-SPECIFIC HYGIENE PROTOCOL



MAIN KEY POINTS

- Compliance with hygiene protocols reduces the risk of introducing animal diseases and other germs onto the farm.
- Create your farm-specific hygiene visitor protocol using this document.
- AVINED's full shower protocol can be found [here](#).



Legend:

- = Filthy
- = Transition
- = Clean

- 1. Sign the visitor logbook
- 2. Study the company's walking route
- 3. Leave personal belongings
- 4. Clean and disinfect necessary materials
- 5. Leave footwear and clothing

CREATE YOUR FARM-SPECIFIC HYGIENE PROTOCOL



CREATE YOUR FARM-SPECIFIC HYGIENE PROTOCOL



For more information:

- AVINED shower protocol: <https://www.avined.nl/themas/bedrijfsmanagement/bedrijfshygiene>
- NETPOULSAFE project : <https://www.netpoulsafe.eu>

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AVINED shower protocol:




https://www.avined.nl/themas/bedrijfsmanagement/bedrijfshygiene/NL5_Create-your-farm-specific-hygiene-protocolsupportingdocument_ENG1.pdf

6.8 how to encourage good behaviour in your hygiene lock.



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HOW TO ENCOURAGE GOOD BEHAVIOUR IN YOUR HYGIENE LOCK




MAIN KEY POINTS

- As a poultry farmer, you want visitors to make the best possible use of the hygiene lock.
- In this factsheet you will read some tricks to encourage your visitor, consciously and unconsciously, to use the hygiene lock as effectively as possible.
- With a hygiene lock that smells dirty, is messy, is cold, is unclear, etc., a visitor may (unconsciously) feel no obligation to behave properly.


There are several ways you can influence visitor behavior:



Fragrance
A hygienic scent (detergent, lemon) makes visitors act more hygienically.



Color
White stands for hygienic and clean. Therefore, for example, use white furnishings, white towels and white underclothing.



Comfort
Provide a heated environment, a hot shower and plenty of soap. This motivates to take more extensive shower.

HOW TO ENCOURAGE GOOD BEHAVIOUR IN YOUR HYGIENE LOCK



Neat and tidy

If you want visitors to use the hygiene lock neatly, make sure it is tidy.



Barriers

- By having the visitor step over a barrier, you make them aware that they are entering from the dirty zone into the transition zone.
- By installing a timer that regulates access between the shower and the dressing area, you guarantee that the visitor is showering long enough.



[Click here](#) to watch the video



Make it easy for the visitor

- Provide a simple and clearly visible shower protocol upon entering the hygiene lock, such as this one hanging it at eye level on the door.
- Provide trays in the dressing area with complete clothing sets in every size.
- After the dressing area, provide a complete supply of footwear in each size in an organized shoe closet.
- Provide laundry baskets in the exit and dressing areas to deposit used towels and company clothing.

More information:

- Google: "priming nudging hygiene"
- NETPOULSAFE project : <https://www.netpoulsafe.eu>

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[Click here](#) to watch the video

7 Factsheets explaining how to correctly implement successful Biosecurity measures for advisors.

7.1 interactive registers of disinfection and use of disinfectants, transport vehicles entering the farm, entrances to poultry houses, and daily inspections of the poultry flock.






INTERACTIVE REGISTERS OF DISINFECTION AND USE OF DISINFECTANTS, TRANSPORT VEHICLES ENTERING THE FARM, ENTRANCES TO POULTRY HOUSES, AND DAILY INSPECTIONS OF THE POULTRY FLOCK



MAIN KEY POINTS:


- Interactive registers are useful tools for data collection of biosecurity measures during daily on-farm operations.
- This data can be a good basis for the discussion and sharing experiences during meetings with other Stakeholders or coaching sessions with the biosecurity Advisor (coach), which is crucial for running a business.

In Poland, from 2022 according to the national law regulation (which refers to HPAI), it became obligatory to keep records of the movement of transport units for poultry, eggs, feed, or carcasses and visitors entering the farm as well as for disinfection and rodent control programs, as a part of the biosecurity plan.



The General Veterinary Inspectorate issued templates - forms to be filled out to help with this data collection:

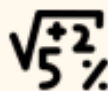
- (1) register of disinfection and the use of disinfectants,
- (2) register of transport units entering the farm,
- (3) register of entries to the poultry house,
- (4) register of daily flock inspections,
- (5) register of rodent monitoring and control program.



INTERACTIVE REGISTERS OF DISINFECTION AND USE OF DISINFECTANTS, TRANSPORT VEHICLES ENTERING THE FARM, ENTRANCES TO POULTRY HOUSES, AND DAILY INSPECTIONS OF THE POULTRY FLOCK

The registers are WORD or EXCEL files with free access and can be downloaded from the Veterinary Inspection web page and printed and adapted to each farm and kept as register books or in digital form.

The collected data for identification and description of any activity in the above aspects and used products for disinfection or deratization (date, time, activity, product, dosage, place, signature, etc.) are checked by Veterinary Inspection during official audits.



These databases can be also used for other purposes since the quick analysis in a computer help Farmers to optimize farm activities and find gaps in the implementation of biosecurity practices.



For more information:

- NETPOULSAFE project: <https://www.netpoulsafe.eu>




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7.2 feed mill biosecurity guide.



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FEED MILL BIOSECURITY GUIDE




MAIN KEY POINTS

- Risk spreading diseases by truck and drivers from feed mills
- Proper protocol for them minimize this risk

The underside and wheels of **feed delivery trucks** and the **transporters** themselves can harbour pathogenic microorganisms attached to them, such as Avian Influenza or *Salmonella*, and can be a source of infection between farms. Therefore,

Therefore, it is advisable to follow the following **biosecurity measures**:

- 1 MEASURES RELATED TO LOGISTIC
- 2 MEASURES RELATED TO CLEANING AND DISINFECTION



FEED MILL BIOSECURITY GUIDE

2

MEASURES RELATED TO LOGISTIC

If possible, it is advisable, try to have feed delivery trucks, **specific by species** and better still, specific **by type of production** (meat/eggs) and **stages of production** (rearing/breeders/fattening).

It is also important to **plan the travel route starting** with farms with **lower health risk and/or higher susceptibility** and **ending** with farms with **higher health risk and/or lower animal susceptibility**. Communication between the person planning the routes and the veterinarian responsible for each farm is essential.

All these measures are aimed at **minimising cross-contamination**.



https://commons.wikimedia.org/wiki/File:Aisao_Diesel_Feed_Tanker_32811814637863329.jpg

BIOSECURITY DRIVERS GUIDE

2

MEASURES RELATED TO CLEANING AND DISINFECTION

When returning the trucks from the farms, at least the **wheels and the underbody** and if possible, the whole surface must be disinfected by means of **disinfection arches or equivalent system** and with an adequate periodicity the whole vehicle including the cabin.

The most advisable would be the introduction of the trucks coming from the farms by a **"dirty" road**, where the disinfection arch would be located and the exit from the feed Mill to other farms by another **"clean" road** in order not to recontaminate the wheels.



By carrying out these measures **together with the correct hygiene of the drivers and disinfection of vehicles** between farms during the route, **the risk of disease transmission from feed-related operations can be minimised.**

For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>




*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe).

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8 Factsheets explaining how to correctly implement successful Biosecurity measures for advisors and farmers.

8.1 checking the effectiveness of cleaning and disinfection in poultry houses.



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CHECKING THE EFFECTIVENESS OF CLEANING AND DISINFECTION IN POULTRY HOUSES

MAIN KEY POINTS


- Poultry houses must be cleaned and disinfected (C&D) at the end of each production cycle.
- C&D limits cross contamination of infections into new flocks.
- In Belgium, C&D procedures in poultry houses are checked with hygienograms.

There are 7 steps towards effective C&D



```

graph TD
    A["Dry cleaning to remove any residual organic debris (faeces, feathers, etc.) which may interfere with effective disinfection."] --> B["Soaking the surfaces (floor and walls) with water and detergent"]
    B --> C["High pressure cleaning with water to remove detergent from the previous step"]
    C --> D["Drying time long enough so that the residual water will not dilute the disinfectant"]
    D --> E["Disinfection with a chemical agent following manufacturer's recommendations to reduce the germ load"]
    E --> F["Complete drying of the houses before introducing new birds to avoid direct contact with any remaining disinfectant solution"]
    F --> G["Testing C&D efficacy by determining the bacterial load on cleaned surfaces"]
            
```



CHECKING THE EFFECTIVENESS OF CLEANING AND DISINFECTION IN POULTRY HOUSES


In Belgium, C&D efficacy checks are managed (by HOSOWO certified veterinarians, Dierengezondheidszorg Vlaanderen DGZ or ARSIA) using hygiene monitoring with hygienograms, which determine the total aerobic (bacterial) count (TAC) of cleaned surfaces sampled with agar contact plates (ACP) and bacteriological swabs.

Sampling frequencies set by regulation to control cleaning methods


	Broiler	Layer	Breeding poultry
Belplume	Every 3 production rounds. Every year minimum of 2 samplings per stable	Prior to the establishment of each new production round.	Prior to the establishment of each new production round.
IKB	once a year a sampling per stable	every 2 production rounds	
Royal Decree Belgium 08/10/1998, Ministerial Decree Belgium 08/19/1998)	sampling every 3 production rounds with a minimum of once a year	sampling before each new flock	sampling before each new flock
For a Salmonella-positive flock	every 3 production rounds, a minimum of once a year.		

- ❖ The sampling is carried out within 24 to 72 hours after disinfection.
- ❖ Between the disinfection and the sampling, the houses must be adequately ventilated for at least 2 hours and completely dried up.
- ❖ The poultry farmer must inform the company veterinarian or a recognized laboratory for the sampling.


CHECKING THE EFFECTIVENESS OF CLEANING AND DISINFECTION IN POULTRY HOUSES




Floor




Feed system



Anteroom



Wall



Dierengezondheidszorg Vlaanderen vzw
 Industrielaan 29 | Tel.: 078 05 05 23 | helpdesk@dgz.be
 8820 Torhout | Fax: 078 29 33 23 | www.dgz.be

Score bacterie kolonies (B) SOP/BAC/AV4/04	
Monsternameplaats	Resultaat
Vloer	1
Vloer	1
Vloer	1
Vloer	1
Voerhopper	1
Voersysteem	0
Voersysteem	0
Voersysteem	0
Voersysteem	1
Voorruimte	1
Wand	0
Wand	0
Wand	1
Gemiddelde	0,5
Gemiddelde IRB-NL	0,5 (°C)

°C: Gemiddelde van alle monsters uitgedrukt in besmetbaarheid, Vlaanderen

The number of bacterial colonies (cfu: colony forming units) in the house are measured and given scores

0 cfu (score "0") 1-40 cfu (score 1)	41-120 cfu (score 2) 121-400 cfu (score 3)	> 400 cfu (score 4) innumerable (score 5)
---	---	---

The report includes the individual sample scores as well as the average scores

Measures to be taken according to the scores obtained		
≤1.5	1.5 ≤ 3.0	> 3.0
In agreement. New stock can be introduced	Repeat disinfection Introduce new stock after the next vacancy period	Re-cleaning and disinfection and new hygienogram. Introduce new stock after the next vacancy period

CHECKING THE EFFECTIVENESS OF CLEANING AND DISINFECTION IN POULTRY HOUSES

Who does the sampling and testing ?



- Only authorized laboratories should perform sampling and testing.
- Sampling and testing in breeder farms are done by DGZ/ARSIA.
- For Broilers and layer farms HOSOWO certified companies/vets can also do the sampling.

HOSOWO-recognised organisation have earned accreditations for performing the following laboratory activities:

- Sample collection for hygienograms
- Sample analysis for hygienograms
- Sample collection for stall testing: presence of Salmonella and Campylobacter after cleaning and disinfecting



Take home message

Hygienograms are surface bacterial counts that are used to monitor the efficiency of cleaning and disinfection of the empty house between flocks. Evaluation of cleaned surfaces after C&D helps to better prevent infections through residual sources of infectious material.

For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>




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8.2 improving biosecurity in anterooms using fluorescent substances.




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IMPROVING BIOSECURITY IN ANTEROOMS USING FLUORESCENT SUBSTANCES








KEY POINTS

- Anterooms play an important role in biosecurity (farmers, visitors)
- Clothes changing, footwear donning, handwashing
- Practical formation using fluorescent substances which mimic contamination

Biosecurity practices in the anteroom are **efficient** if ...

- ... they are applied in the **right order**
- ... they are applied in the **right zone**

Pathogens are **invisible** and the **risk** may be **underestimated**



A formation **making the invisible visible** (fluorescent substances made visible under UV light) :

- ✓ Increases **risk awareness**
- ✓ **Tests and questions the efficacy** of biosecurity measures in anterooms
- ✓ Focuses on **handwashing, footwear donning and clothes changing**

IMPROVING BIOSECURITY IN ANTEROOMS USING FLUORESCENT SUBSTANCES

In practice: efficacy of handwashing



1
Application of the invisible fluorescent substance



2
Visualisation under UV light of the « contamination »



3
handwashing



4
Visualisation under UV light of the residual « contamination » after handwashing

In practice : efficacy of footwear donning



1
Application of the invisible fluorescent substance



2
Visualisation under UV light of the « contamination »



3
Footwear donning



4
Visualisation under UV light of the « contamination » after changing zone

- handwashing: this type of formation is regularly used in hospital settings for medical staff
- Footwear donning and clothes changing: very important for farm biosecurity, but a more complex activity to manage with groups → **videos recordings** of the activity can prove useful
- **Farmers want more practical and playful formations**

For more information:

- [Watch how to use an anteroom in this video](#)
- NETPOULSAFE project : <https://www.netpoulsafe.eu>


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101000728 (NetPoulSafe)




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- [Watch how to use an anteroom in this video](#)


8.3 basic hygiene measures against avian influenza infections.



BASIC HYGIENE MEASURES AGAINST AVIAN INFLUENZA INFECTIONS









KEY POINTS

- Avian influenza is a highly contagious disease
- By maintaining hygiene status of farm and following basic biosecurity standards, we can significantly reduce the risk of contamination of the poultry farm / flock




- **Introduction of birds**
if possible, poultry from only one source and with a well-known flock health status - with official certificates by veterinarians - should be purchased

- **Application of zones**
use black and white zone implementation on the farm to separate the high risk areas – dirty zone – from the low ones – clean zone




- **Enclosed barns**
it is a fundamental fact that enclosed poultry houses are less risky to be infected than the other housing systems - like free range or half-closed

- **Bedding**
keep the litter undercover and away from wild birds and check the quality before take inside the barn



- **Bedding**
keep the litter undercover and away from wild birds and check the quality before take inside the barn



BASIC HYGIENE MEASURES AGAIN AVIAN INFLUENZA INFECTIONS

- **Staff**
pay careful attention to continuous biosecurity training of farmworkers
- **Visitors and vehicles**
keep accurate, well-maintained records of all persons and vehicles coming in the farm
- **Pest control**
implement a pest control program of wild birds, rodents and insects by an official expert company
- **Regular veterinary health monitoring and review**
crucial the regular herd checks and necropsies by the farm veterinarian
review the biosecurity plan of the farm and flock health program with farm veterinarian on a regular basis



For more information:

- NETPOULSAFE project : <https://www.netpoulsafe.eu>

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8.4 the importance of checking the efficacy of cleaning and disinfection.



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THE IMPORTANCE OF CHECKING THE EFFICACY OF CLEANING AND DISINFECTION







KEY POINTS

- The quality of the cleaning and disinfection process can be verified only by checking of the procedure.
- The hygiene program will not more effective by using popular and expensive chemical products, than use the certified products properly on by a good procedure
- Detection of indicator bacteria on surfaces cleaned and disinfected with chemical agents can be a proven and effective method to monitor efficacy
- By counting the number of micro-organisms per certain unit surface area, this method – total aerobic bacterial counts – can show the reduction of bacterial count on surfaces what cleaned and disinfected with chemicals.

Indicator microorganisms – e.g. *Escherichia coli*, *Staphylococcus aureus*, *Salmonella spp.*

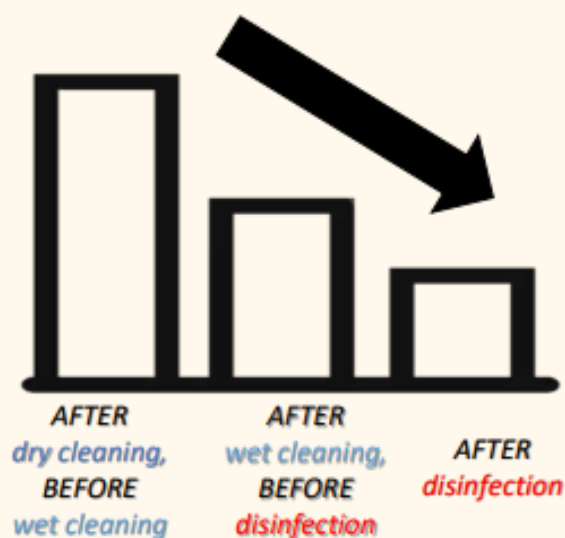
- Such kind of organisms whose easy to isolate and identify and at the most of the cases they can be present at higher level on the sampled surface than the pathogen.
- Generally indicator bacterias are easy to remove (clean and disinfect) from the materials, however, if the hygiene programme is of poor quality, these micro-organisms will be the first to appear in the environment



THE IMPORTANCE OF CHECKING THE EFFICACY OF CLEANING AND DISINFECTION

Total aerobic bacterial count

- During the process of cleaning and disinfection, the amount of micro-organisms is constantly reduce



- The reduction of bacteria during the cleaning process is much greater than during disinfection.
- Cleaning (dry and wet) removes - physically - the certain amount bacteria.
- The use of disinfectants the rest of micro-organisms that remain after cleaning.
- Disinfection can only be successful and effective after an adequate cleaning process.
- It is therefore essential to focus on the cleaning phase the most.
- The only way to know the quality of a hygiene programme is to check it with microbiological tests.

For more information:


- NETPOULSAFE project : <https://www.netpoulsafe.eu>

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8.5 the importance of external and internal biosecurity.



The importance of external and internal biosecurity





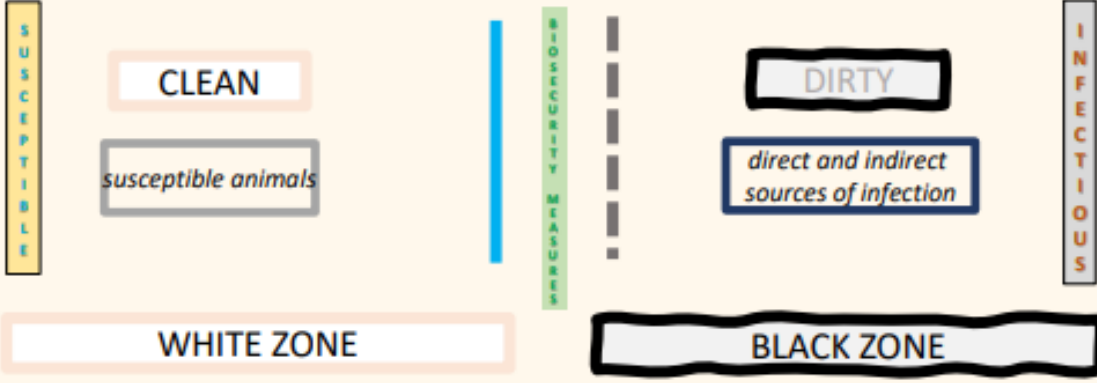


KEY POINTS

- It is very important to protect farm animals from infection.
- We need to prevent the introduction of infectious diseases into the farm and making the animals sick.
- However, it is also crucial to prevent - if a disease appears in one barn - the spread of infection from one barn to another

Hygiene barriers are used to separate high and low risk areas from each other.

DIFFERENTIATION OF BIOSECURITY ZONES OF ANIMAL FACILITY



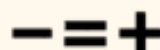
The black zone is the area outside the farm and premises, where the likelihood of infection is much higher than inside the farm and buildings.

THE IMPORTANCE OF INTERNAL AND EXTERNAL BIOSECURITY

EXTERNAL BIOSECURITY

Essential parts of external biosecurity – *avoid introduction of diseases to the farm from outside*

- Hygiene lock („sanitary barrier“)**
not only the hygiene of visitors is important, but also the hygiene status of vehicles entering the site or any kind of material what we want to take/carry in the poultry farm
- Withdrawal time“ („waiting / resting time“)**
it is standard practice in the biosecurity programme of animal farms to allow visitors to the holding only if they have not been on another farm within 24/48/72 hours
- Purchase of animals and loading / unloading of farms**
it is better to purchase a larger number of animals at once from the same source than a smaller number of animals more times separate sources
- Quarantine block**
it is crucial that, if we are forced to purchase animals from more than one source, one age group can only be housed in one barn the stock subsequently brought to the farm must be placed in a separate building and reared in a quarantine zone for at least 3 weeks
- Never-ending vet farm visits**
continuous veterinary herd-health inspection and sampling for laboratory investigation is important, not only during the quarantine period, but also during the operation time of the farm



THE IMPORTANCE OF INTERNAL AND EXTERNAL BIOSECURITY

INTERNAL BIOSECURITY

Essential parts of internal biosecurity – *avoid spread of infectious agents within the farm from one age category to another or from one production group to another*

- **All in - all out (AI/AO)**
the more we break down the bio-containment, the greater the chance of disease introduction and spread
- **Disease management (monitoring, vaccination, treatment)**
regular veterinary inspection is crucial, not only to maintain external, but also internal biosecurity
- **Maintain the general hygiene status of the farm and flock**
the use of hygiene barriers between barns (flocks), the use of boots-disinfection, hand washing and the cleaning and disinfection procedure during the service period are essential
- **Compartmentalisation and work pathways**
the separation of clean and dirty zones within the site is very important to reduce the risk of spread the disease inside the farm
- **Operational biosecurity**
strict, full compliance with the described biosecurity requirements and continuous control of rule respecting conduct are essential

For more information:


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8.6 the principles of proper farm cleaning and disinfection program.



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THE PRINCIPLES OF PROPER FARM CLEANING AND DISINFECTION PROGRAM



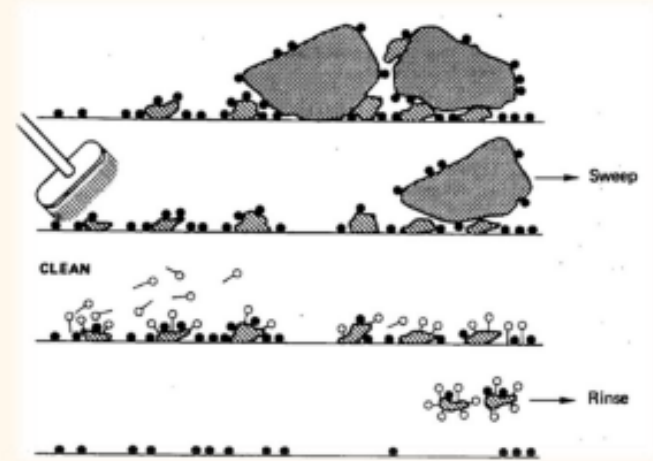


KEY POINTS

- It is essential that animals are kept in farms where the risk of infection by infectious diseases is minimised
- The pathogenicity of some facultative pathogens may increase with increasing germ counts.
- Even large numbers of microorganisms can overload the immune system, what can lead to decrease in production.

The purpose of cleaning and disinfection:

- reduce the number of microbes on surfaces (and in the air) to a level and in a manner that ensures that most - if not all - pathogens and zoonotic agents are eliminated
- reduce infection pressure (~protect freshly hatched, immunocompromised animals)



The diagram illustrates the process of cleaning and disinfection in three stages. The first stage, labeled 'Sweep', shows a broom sweeping debris and large clumps of organic matter from a surface. The second stage, labeled 'CLEAN', shows the surface after the debris has been removed, with many small, individual microorganisms still present. The third stage, labeled 'Rinse', shows water being applied to the surface, which is washing away the remaining microorganisms. The final state shows a clean surface with very few microorganisms left.

THE PRINCIPLES OF PROPER FARM CLEANING AND DESINFECTION PROGRAM

Basic definitions

- **Cleaning**
the (physical) removal of organic and inorganic material, including biofilms where present, in order to make micro-organisms and pathogens accessible to disinfectants
- **Disinfection**
ideally kills most of the pathogens remaining after cleaning (depending on the disinfectant and environmental conditions)



Untreated surface



Surface after cleaning



Surface after disinfection

THE PRINCIPLES OF PROPER FARM CLEANING AND DESINFECTION PROGRAM

The most important steps and processes are in the cleaning and disinfection protocol

1. **DRY CLEANING**
remove the maximum amount of manure and litter with working machine and hand broom
2. **DISMANTLING OF TECHNOLOGICAL EQUIPMENT**
these parts will have to be cleaned separately
3. **WET CLEANING**
use detergent (soap) to dissolve organic and inorganic components of dirt
the drinker line system must be treated with a cleaning and disinfecting agent
important to clean the outside part of the barns as well
4. **FLUSHING, WASHING**
washing out the previously spreaded cleaner product from the barn
5. **DRYING OUT OF THE BARN**
let the barn dry out before start the disinfection procedure to avoid the dilution of the disinfectant
6. **MAINTENANCE WORK**
carrying out most of the maintenance work on the farm and inside the barns
7. **DISINFECTION**



For more information:


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8.7 principles of biosecurity for hunters.




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PRINCIPLES OF BIOSECURITY FOR HUNTERS




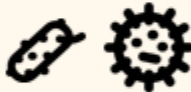
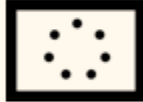






MAIN KEY POINTS

- The risk of the transfer of pathogens into the poultry farm for hunters (farmers, farm workers, or visitors) coming into contact with infected wild birds or a contaminated environment is high.
- Hunters must follow specific biosecurity procedures during hunting and before entering the farm .

It is absolutely necessary that hunters (farmers, farm workers, or visitors) who hunt wild birds (ducks, geese, and other species), should be aware of the risk and have to follow appropriate biosecurity measures to minimize the possible transmission of the diseases (HPAI, ND, and others) to poultry.

It is necessary to immediately report to the competent authority finding dead wild birds, and birds, whose behaviour may indicate infectious disease (symptoms such as tremors, head tilting, lethargy, loss of coordination, inability to fly or walk, or trouble standing upright).

PRINCIPLES OF BIOSECURITY FOR HUNTERS

The specific biosecurity procedures for hunters:

- Contact with the carcasses of wild birds should be performed only with the use of disposable gloves.
- After each contact with live wild birds or hunted carcasses wash the hands with soap and water and disinfect them.
- clothing, footwear, and other equipment used for hunting (which may be contaminated) have to be cleaned and disinfected after the hunt.



- Dead or hunted birds should be placed in airtight containers or plastic bags to prevent the possible spread of pathogens through the blood or feces.
- It is forbidden for hunting dogs to have any close contact with poultry for at least 72 hours from the end of the hunt.
- The hunters (farmers, farm workers, or visitors) have to keep the poultry-free period for at least 72 hours.



For more information:


- NETPOULSAFE project: <https://www.netpoulsafe.eu>



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8.8 protocol for egg collection.



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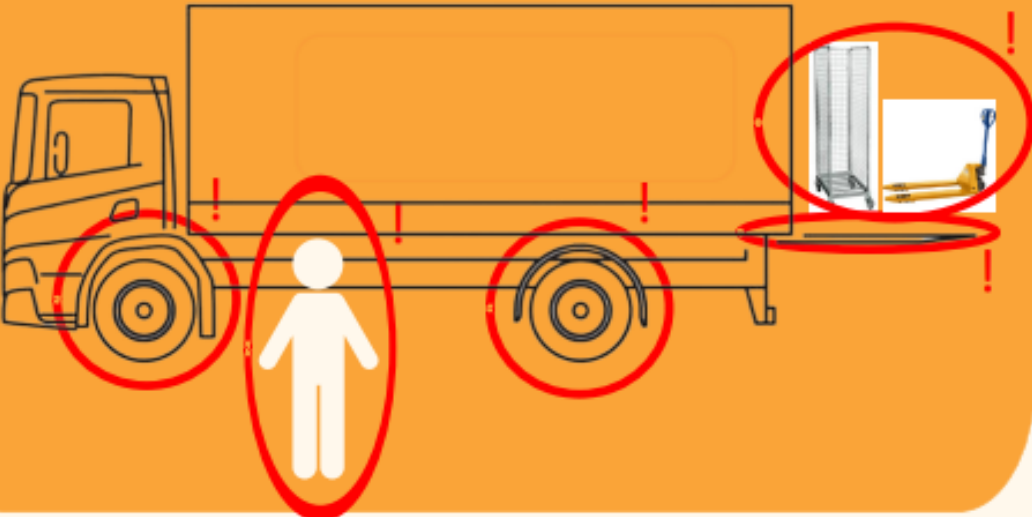
PROTOCOL FOR EGG COLLECTION



MAIN KEY POINTS

- Biosecurity risks with respect to egg transportation
- Visitor protocol for drivers
- Tips for the poultry farmer

These are the biosecurity risks with respect to egg transportation:



PROTOCOL FOR EGG COLLECTION

Visitor protocol for drivers



When leaving



PROTOCOL FOR EGG COLLECTION

Tips for the poultry farmer

- Use a watering can with an appropriate disinfectant to disinfect the premises from the egg room door to the truck loading ramp when the driver comes to pick up the eggs.
- Do not accept dirty crates because pathogens can survive longer in organic residues. Speak to the driver about this.



- Disinfect the egg storage room and the newly brought egg trays and pallets after the eggs have been collected.
- Give the driver access only to the egg storage area and not the collection room to keep his walking route within the farm as short as possible.

[Click here](#) to watch the video



More information:

- Hygiëneprotocol eiervervoer | Voorschrift | NVWA
- NETPOULSAFE project: <https://www.netpoulsafe.eu>


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[Click here](#) to watch the video

8.9 development of biosecurity instructions regarding organizational and equipment requirements dedicated to vaccinations on a poultry farm.



DEVELOPMENT OF BIOSECURITY INSTRUCTIONS REGARDING ORGANIZATIONAL AND EQUIPMENT REQUIREMENTS DEDICATED TO VACCINATIONS ON A POULTRY FARM






MAIN KEY POINTS

- Implementation of vaccination programs on poultry farms is part of a good biosecurity plan.
- Specific biosecurity procedures which refer to the vaccination should be established and adapted to farm conditions.

➤ Multiple visits by vets and vaccination crews and their movement on the farm bring a risk of the introduction of pathogens and spreading between the houses.

➤ Keeping at least 12 hours of the non-bird contact period, and following biosecurity protocols when entering the farm and house are crucial.

➤ It is also recommended to have a separate room or place in the anteroom of the house dedicated to the vaccination.



DEVELOPMENT OF BIOSECURITY INSTRUCTIONS REGARDING ORGANIZATIONAL AND EQUIPMENT REQUIREMENTS DEDICATED TO VACCINATIONS ON A POULTRY FARM

- The separate room or place in the anteroom of the house dedicated to the vaccination should be equipped with a table, sink, paper towels, hands disinfection stations, a fridge for storing the vaccines, and cabinets for the equipment dedicated to the farm and used only for the vaccination.

- Any equipment entering the farm as sprayers, measuring containers (beakers, etc.), semi-automatic or automatic syringes, and buckets have to be properly prepared by cleaning, sterilization, and disinfecting according to the manufacturer protocols for each device.
- The outside surface of the portable fridges, coolers, containers (for vaccine bottles, and vials) should be disinfected in the farm hygiene lock.
- The birds on the farm should be vaccinated for one day on the whole farm.



- All empty boxes, bottles, vials, and vaccine residues after vaccination should be inactivated in disinfectant and should be removed according to biosecurity protocol in an incinerator or by rendering company with properly labeled (plastic, glass, steel, other) airtight bags.



For more information:

- NETPOULSAFE project: <https://www.netpoulsafe.eu>

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9 Conclusion

This Handbook compiles 50 SM for both farmers and advisors that will ultimately help improve biosecurity in the poultry sector from the feed factory through transportation, slaughterhouse and of course in all types of poultry farms.



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