Project: Technical assistance to improve implementation of food safety standards and disease crisis preparedness

Training course: Animal Health and Operator responsibilities

Lecturer:

_____

Blagojcho Tabakovski

Date: ……..

Place: ____, Cyprus

Project funded by the European Union within the scope of the Aid Programme for the Turkish Cypriot community,

implemented by the NSF Euro Consultants Consortium

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Content

- Main principles of Animal Health
- ‘veterinary directorate’ responsibility
- Operator’s responsibilities for:
  - ✓Animal Health
  - ✓Animal Identification and registration
  - ✓Animal traceability
  - ✓Animal movement
  - ✓Early detection and notification
  - ✓Biosecurity
  - ✓Milk hygiene
  - ✓Feed hygiene

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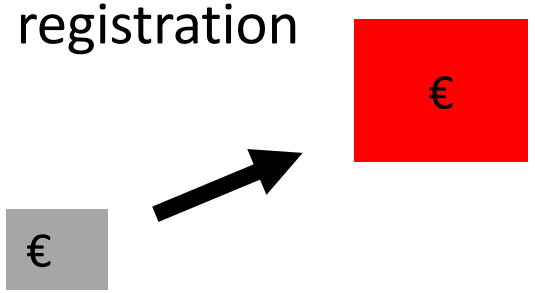
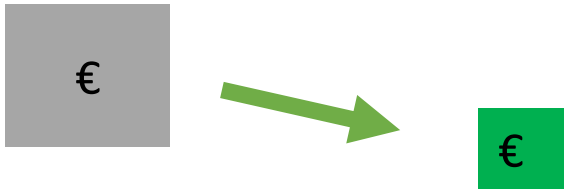
Main principles of AH

- Regulation (EU) 2016/429 (‘Animal Health Law’) (AHL)
  - Risk-based
  - Preventive approach
  - List of disease
  - Measures in case of disease
  - Surveillance
  - Identification and registration of animals
  - Farmers’ responsibilities
  - Biosecurity
  - Antimicrobial resistance
  - Safe trade

Reactive
cure



Proactive
Prevention



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Operator's Responsibilities

- The health of their animals, biosecurity, etc.
- Knowledge of animal health
  - Animal diseases, biosecurity, interaction with animal welfare, good husbandry practices, prudent use of antimicrobials and antimicrobial resistance
- Observe the animal health
- Observe changes in production
- Observe abnormal mortalities and other signs of animal health
- Animal health visits

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Legal framework

The categories of listed diseases for the listed species and groups of listed species referred to in the table-Regulation (EU) 2018/1882

Name of listed disease	*Category of listed disease*	*Listed species*	
		Species and group of specie	*Vector species*
Foot and mouth disease (FMD)	A+D+E	Artiodactyla, Proboscidea	
Sheep pox and goat pox (S&GP)	A+D+E	Ovis ssp., Capra ssp	
Infection with peste des petits ruminants virus (PPR)	A+D+E	Ovis ssp., Capra ssp., Camelidae, Cervidae	
Lumpy skin disease (LSD)	A+D+E	Bison ssp., Bos ssp., Bubalus ssp.	Haematophagous arthropods

Legal framework

Name of listed disease	*Category of listed disease*	Listed species	
		Species and group of specie	*Vector species*
Brucellosis *Infection with Brucella abortus, B. melitensis, B. suis*	B+D+E	Bison ssp., Bos ssp., Bubalus ssp., Ovis ssp., Capra ssp.	
	D+E	Artiodactyla others than Bison ssp., Bos ssp., Bubalus ssp., Ovis ssp., Capra ssp.	
	E	Perissodactyla, Carnivora,	
Infection with Mycobacterium tuberculosis complex (M. bovis, M. caprae, M. tuberculosis)	B+D+E	*Bison* ssp., *Bos* ssp., *Bubalus* ssp.	
	D+E	*Artiodactyla* others than *Bison* ssp., *Bos* ssp., *Bubalus* ssp.	
	E	*Mammalia* (terrestrial)	
Bluetongue *Infection with bluetongue virus (serotypes 1-24)*	C+D+E	Antilocapridae, Bovidae, Camelidae, Cervidae, Giraffidae, Moschidae, Tragulidae	Culicoides spp.

FMD Clinical signs

- **Morbidity (number of animals getting sick):** up to 100% in susceptible populations.
- **Mortality (number of animals that will die):** adult animals (1–5%), but higher in young calves, lambs and piglets (20% or higher).

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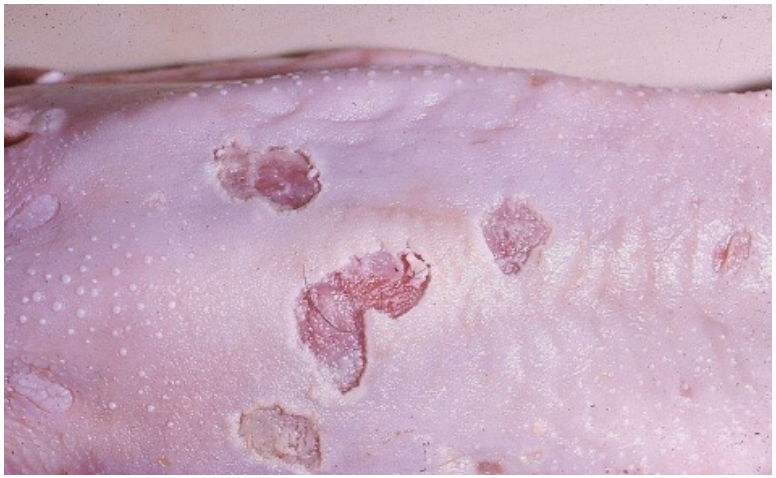
FMD Clinical signs

- The typical clinical signs are:
- blisters or vesicles
- fever
- hypersalivation
- loss of appetite
- decrease in milk yield
- lameness and reluctance to move or eat



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Clinical sings S&GP

- **Morbidity** from 1% to 70-90% in fully susceptible flock
- **Mortality** up to 100% in highly susceptible young animals

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Clinical Signs

- Fever
- Conjunctivitis
- Depression, anorexia
- Dyspnea, nasal or ocular discharge
- Secondary bacterial infections are common

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Clinical Signs

- Papules forming into hard scabs
- Lesions may cover the body or be restricted to the axilla, perineum groin, ears, or tail
- Death may occur at any stage

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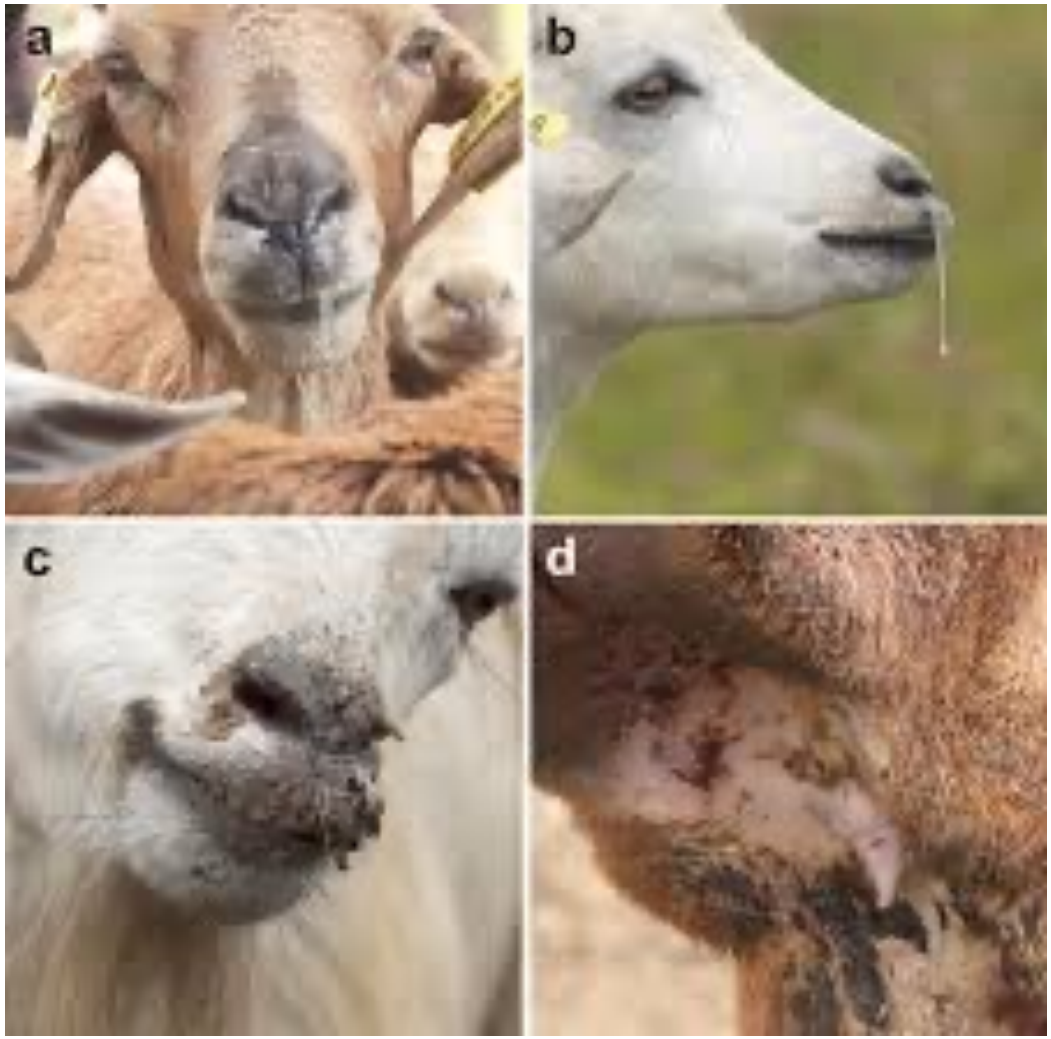
PPR

- HIGH Morbidity/HIGH Mortality



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Clinical Signs

- High fever
- Serous nasal, ocular discharge becomes mucopurulent
- Hyperemic gums, necrotic oral lesions

- Profuse diarrhea
- Rapid respiration, dyspnea
- Abortion
- Skin nodules around muzzle
- Subacute, asymptomatic disease

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LSD - Epidemiology

- Morbidity
  - Widely variable
  - 10% to 20%
- Mortality
  - Usually low
  - 1% to 5%

Primary transmission route: **biting insects**






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Center for Food Security and Public Health, Iowa State University, 2011

Clinical Signs

- Inapparent to severe infection
  - ✓Young calves are most susceptible
- Nodule development
- Decreased milk yield

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Center for Food Security and Public Health, Iowa State University, 2011

Clinical Signs

- Raised, circular, firm, coalescing nodules
- Secondary bacterial infections
- Rhinitis, conjunctivitis
- Lameness
- Abortion and sterility

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Center for Food Security and Public Health, Iowa State University, 2011

BT - Bluetongue

- HIGH Morbidity/LOW Mortality

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Clinical Signs

- Coronitis
  - ✓Inflammation of coronary band
- Lameness
  - ✓Painful hooves

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Brucellosis

- **Bacterial disease:** Brucellosis in cattle (B. abortus) in sheep and goats (B. melitensis) and in swine (B. suis)
- **WIDE hosts :** cattle, swine, sheep and goats, camels, equines, and dogs
- **Transmission dynamics:** typically spread when the animal aborts or gives birth (vaginal discharge, aborted fetus, placenta), bacteria also colonise the udder and contaminate the milk.
- **Persistence:** bacteria can survive outside the animal in the environment for several months, particularly in cold moist conditions.

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Brucellosis – clinical sings

- Very mild, most common
  - ✓Arthritis, epididymitis - orchitis, chronic fatigue
- Swelling of the neck or back in horses
- Abortions
- Other reproductive symptoms
  - ✓Infertility, retention of placenta, stillbirth or birth of weak offspring.

- ZOONOZIS
- Occupational disease
  - Farmers
  - Veterinarians
  - Abattoir workers
  - Lab workers

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Tuberculosis

- **Bacterial disease :** *Infection with Mycobacterium tuberculosis complex (M. bovis, M. caprae, M. tuberculosis)*
- **Hosts :** cattle, (badgers, goats, pigs, ferrets, cats, deer)
- **Transmission dynamics:** unpasteurized dairy products, raw or undercooked meat, aerosol, skin lesions,
- **Persistence:** particularly in cold, dark moist conditions.

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Brucellosis - clinical sings

- Develop over months, asymptomatic
- Later stage
- Fever,
- Weakness,
- Moist cough
- Enlarged lymph nodes
- **Granulomas**

- ZOONOZIS

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What is most important for the contagious diseases?

To recognize and notify the disease !!!

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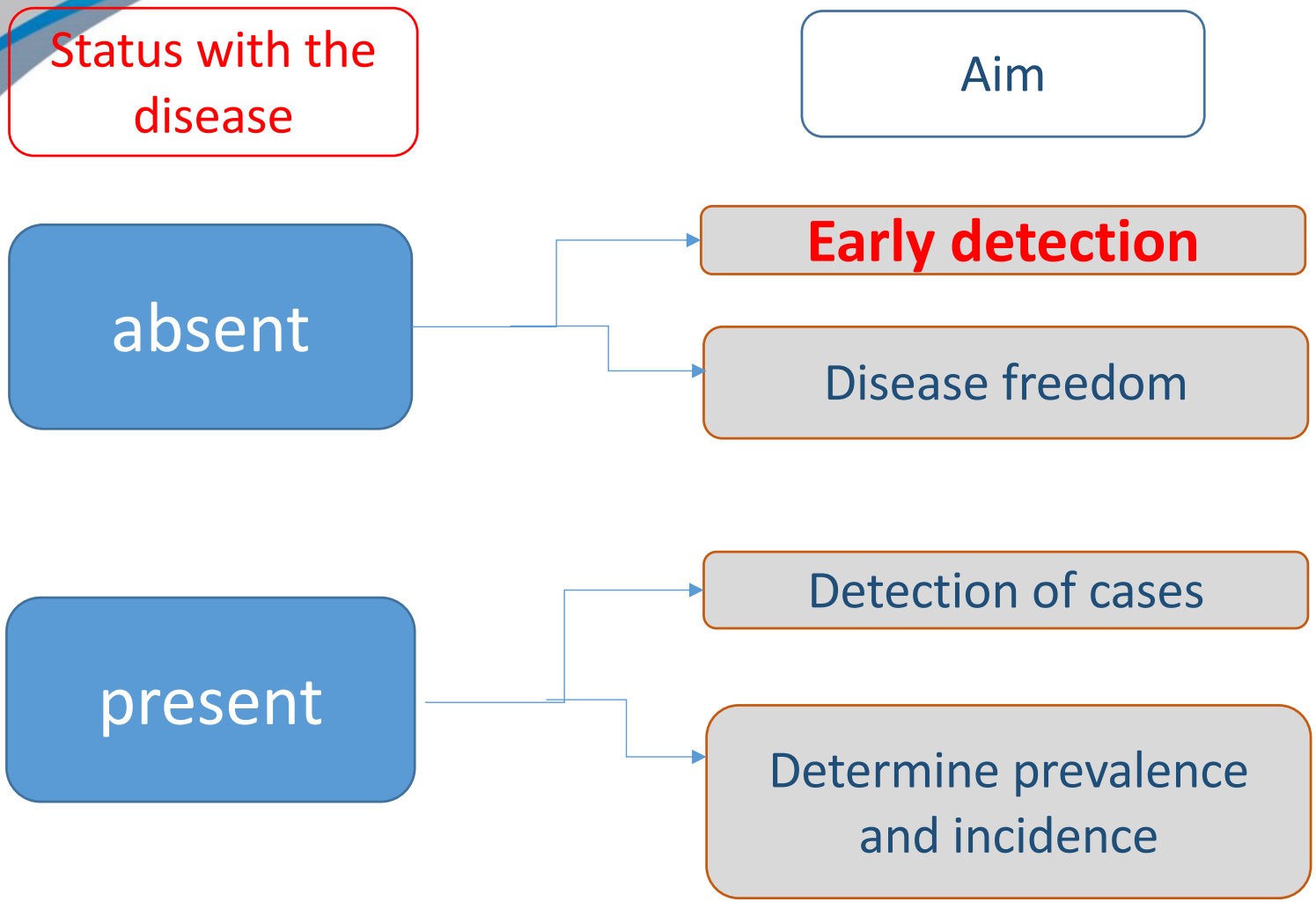
Possible scenarios with disease



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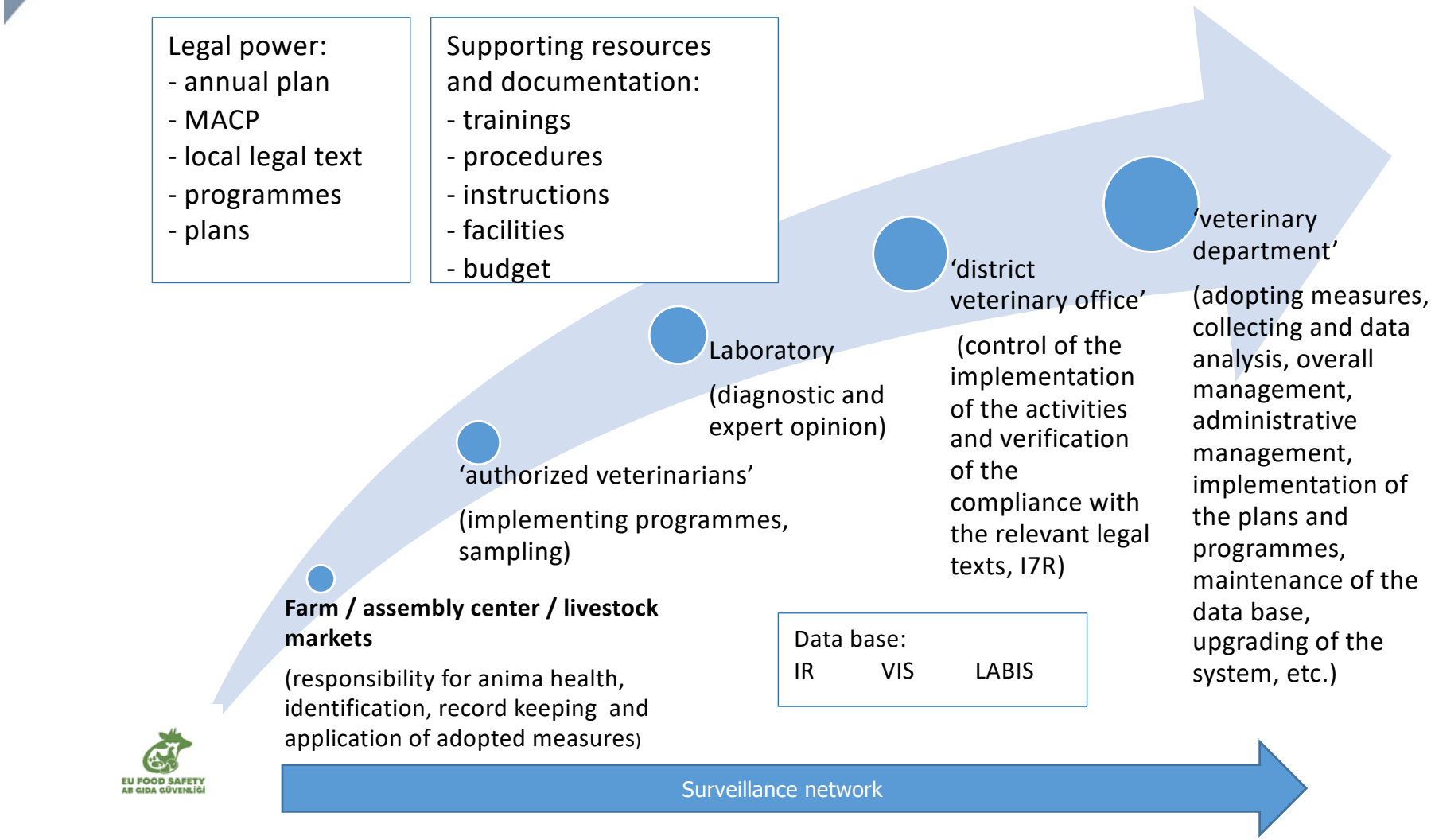
You are very, very, important part of system!!!



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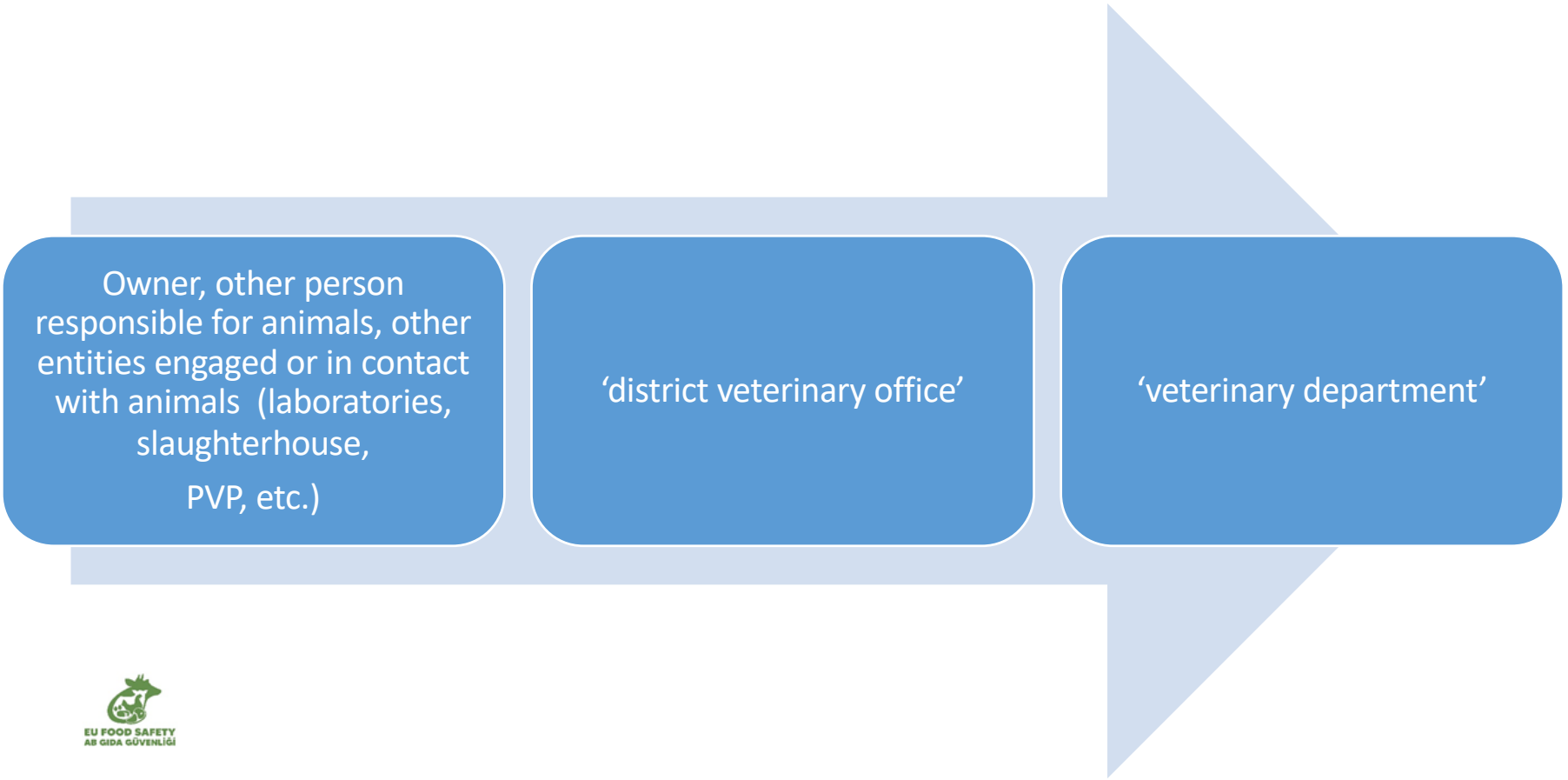
Obligation to report disease

- *A legal obligation by veterinarians and other relevant stakeholders to report suspected cases or cases of notifiable diseases or emerging diseases.*



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What is early warning system?

- Means a system for the timely detection, reporting and communication of occurrence, incursion or emergence of diseases, infections or infestations in a country, zone or compartment.

“It’s an early warning system, it picks up my wife”

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How it works? - actually!!!

Infected animal

Clinical sings

Notification (due to Clinical sings)

notification of private veterinarians ‘district veterinary office’

‘dvo’ collect samples

Case confirmed in laboratory

Case confirmed

NO CASE!!!

How long have you been not well?

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Clinical sings - SIGNALS for notification

- There are abnormal mortality rates.
- There are abnormal morbidity rates in animals.
- There is rapid spread of disease through on a holding.
- Several species are affects on the holding.
- There is a sudden reduction in production.
- There is sudden reduction of feed or water intake.
- There are unusual and concerning clinical signs of disease in animals.
- Animals are reluctant to move.
- Animals have ulcers, erosions or blisters around the feet, muzzle, udder or in the mouth, diarrhea.
- Animals are lame and drooling or salivating excessively.
- Affected animals display unusual nervous signs.

Investigation - ‘vd’ responsibility

- Selection of the animals for clinical examination and sampling.
- Detailed clinical examination of affected individual animals.
- When relevant, conduct post-mortem examination(s).
- Collect and submit laboratory samples to confirm or rule out the disease:
  - ✓Category A disease immediately
  - ✓Category B or C in 24 hours

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Measures on the infected establishment - Category A disease

STEMPING-OUT

- All animals of listed species kept in the affected establishment shall be killed as soon as possible on the spot.
- Implementing all appropriate and necessary biosecurity measures.
- Bodies or parts of kept animals of listed species which have died, or which have been killed shall be safely disposed of.
- All potentially contaminated products, materials or substances present in the establishment shall be isolated and disposed of.
- Cleaning and disinfection.
- In some cases, vaccination is practiced to suppress the spreading of disease.

Operators' responsibility - Category A disease

- Isolate all animals suspected of being infected with the category A disease.
- Keep the manure, including litter and used bedding, and any product, material or substance likely to be contaminated with and to transmit category A diseases isolated and protected from insects and rodents, kept animals of non-listed species and wild animals to the extent technically and practically feasible.
- Implement the appropriate additional biosecurity measures to avoid any risk of spread of the category A disease.
- Cease all movements of kept animals of listed species from or to the establishment.
- Prevent non-essential movements of animals of non-listed species, products, materials, substances, persons and means of transport from or to the establishment.
- Ensure that production, health and traceability records of the establishment are updated;.
- Provide the 'vd', on its request, with any relevant information regarding the category A disease.
- Follow any instructions given by the 'vd' regarding the control of the category A disease.

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Operators' responsibility - Category B disease

- Implement surveillance as ordered by the 'vd'.
- Disease control measures in the event the disease is suspected or confirmed.
- Isolate the suspected or positive animals.
- Slaughter positive animals.
- Restrict the movement of animals and products.
- Test the animals to resolve disease free status.
- Milk from confirmed cases shall either be fed only to animals in the same establishment after it has been processed to ensure the inactivation of the disease agent, or it shall be disposed.
- Manure, straw, feed or any other matter and substance which has come into contact with a confirmed case or with contaminated material shall be either collected and disposed of as soon as possible or, following an appropriate risk assessment, stored and processed to reduce to an acceptable level the risk of spreading of the disease.

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Operators' responsibility - Category B disease

- Cleaning and disinfection.
- All parts of the establishments that may have been contaminated after the removal of the confirmed and suspected cases and before repopulation.
- Husbandry related equipment, medicinal equipment and production related equipment that may have been contaminated.
- Any protective clothing or safety equipment used by operators and visitors.
- All means of transport, containers and equipment after the transport of animals or products from infected establishments.
- Loading areas for animals after each use.

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Registration of establishments

- **Apply for registration -** not take up the activity before the establishment is approved
- **Provide information** as provided for in AHL and/or DR and/or IR
- **Cease the activity** if the ‘vd’ withdraws or suspends the registration/approval
- **Inform** the ‘vd’ of **any changes** and any cessation of activity

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Traceability of kept bovine animals

- Means of identification for kept bovine animals
  - ➢ Each animal individually identified with
    - ✓ two ear tags or
    - ✓ one ear tag and an EID
  - ➢ Time period for application of means of identification: up to 20 days (MS)
    - ✓ MS may derogate for extensively kept animals
- Computer database
  - ➢ Movements to and from the establishment, births and deaths (within 7 days)
- Identification document (or electronically exchange of information) when moved to another MS

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Traceability of ovine and caprine animals

- Means of identification for kept ovine and caprine animals
  - ➢ Each animal
    - ✓ not for slaughter: individually identified with one ear tag + EID
    - ✓ for direct slaughter: identified with at least one ear tag or pastern band
  - ➢ Time period for application of means of identification: up to 9 months (MS)
- Computer database
  - ➢ Movements to and from the establishment (at least batch) (within 7 days)
- Movement document (except when the information is kept in the database)

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Traceability of porcine animals

- Means of identification for kept porcine animals
  - ➢ Each animal identified with at least one ear tag or a tattoo
  - ➢ Time period for application of means of identification: up to 9 months (MS)
    - ✓ before exit from establishment of birth or supply chain
- Computer database
  - ➢ Movements to and from the establishment (batch)
- Movement document

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General principles for all movements

- Applies to movements within and between Member States
- Movements shall not jeopardize the health status at the place of destination
  - Operators are responsible
  - Applies to all kept animals
  - Listed diseases (Cat D) and emerging diseases
- Animals shall come from registered or approved establishments
- Animals shall fulfil the identification and registration requirements
  - Show no clinical symptoms or signs of listed diseases
  - Have been subject to a residency period
  - The health status of the establishment of origin and of destination
  - Test results in order to provide guarantees

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Requirements for bovines (I)

- Residency period 30 days, no contact with lower health status
- Requirements for Brucellosis and Tuberculosis
  - from free establishments, situated in free zones or the animals are tested (BRC test before movement to another establishment)
- From an establishment where there has been no report of
  - rabies and surra for 30 days and anthrax for 15 days
- epizootic haemorrhagic disease for 2 years in an area of 150 km
- «Safe» regarding Bluetongue
- Derogations under conditions if MS of destination gives consent

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Requirements for bovines (II)

- Additional guarantees for C-diseases
  - To zones free from or with an approved programme for EBL, IBR, BVD or Bluetongue
- Derogations for slaughter animals
  - Derogation from residency period
  - From an establishment free from brucellosis (with or without vaccination) and tuberculosis, or the animals are tested
  - From an establishment where there has been no report of rabies and bluetongue for 30 days and anthrax for 15 days

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Requirements for movement TCc

- From farm to farm
  - IR of animals, two ear tag + passport for bovine
  - Testing of the animals on BRC
  - Movement document issued by the PVP
  - C&D transport
- From farm to SH
  - Farm not under restriction
    - IR of animals, two ear tag + passport for bovine
    - Movement document issued by PVP
    - C&D transport
  - Farm under restriction
    - IR of animals, two ear tag + passport for bovine
    - Movement document issue by ‘dvo’
    - C&D of Transport

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Record-keeping

- Operators of establishments and transporters registered or approved in accordance with AHL shall keep and maintain records
- General record-keeping obligations for operators keeping terrestrial animals (species, categories, numbers and identification of animals kept, movements of animals into and out of, documents, mortality, biosecurity measures, surveillance, test results and the results of animal health visits, using of VMP and withdrawal period)

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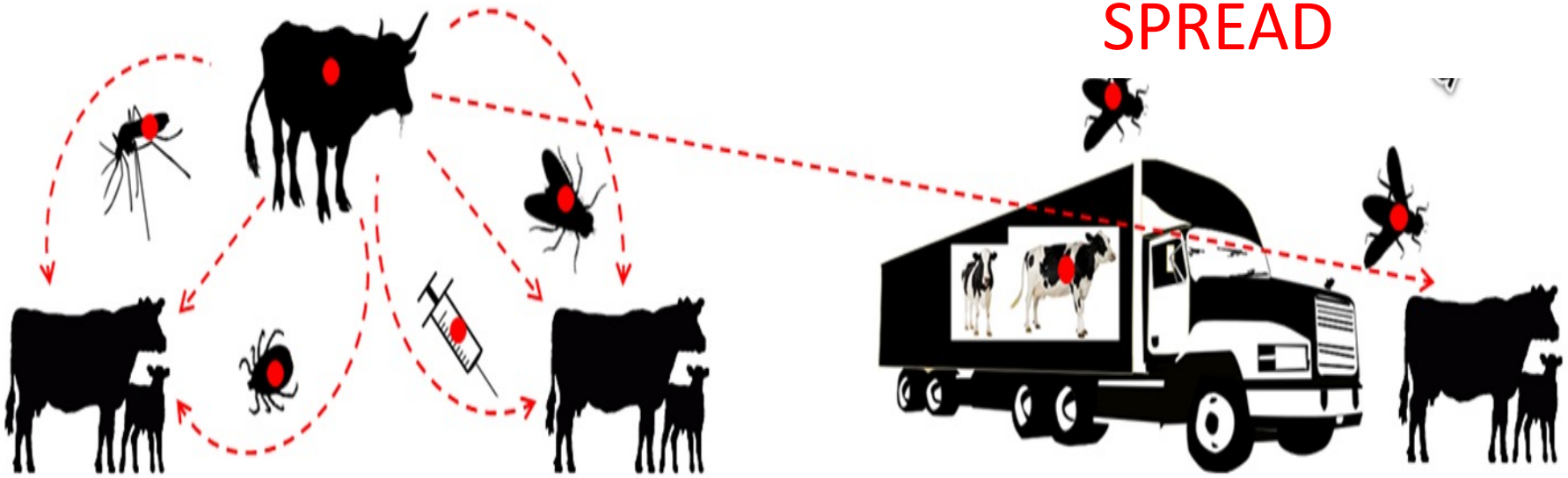
LSD transmission

SHORT DISTANCE SPREAD

LONG DISTANCE SPREAD



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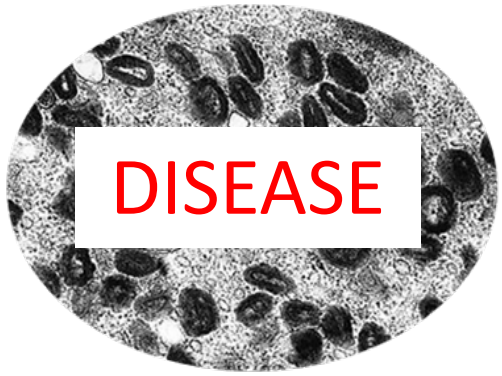
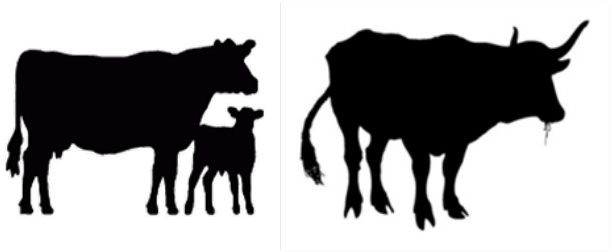
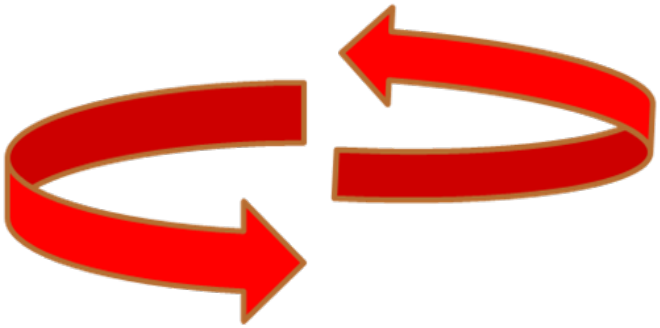
Element for transmission of disease





SUSCEPTIBLE SPECIES



VECTORS

ENVIRONMENT

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EU definition

- AHL, Article 4, point 23
- '**biosecurity**' means the sum of **management and physical measures designed** to reduce the risk of the introduction, development and spread of diseases to, from and within:
  - (a) an animal population, or
  - (b) an establishment, zone, compartment, means of transport or any other facilities, premises or location;
- **Veterinary service** is responsible to be a **good example** and provide of good risk communication for the purpose of the biosecurity processes

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Biosecurity parts

Physical measures

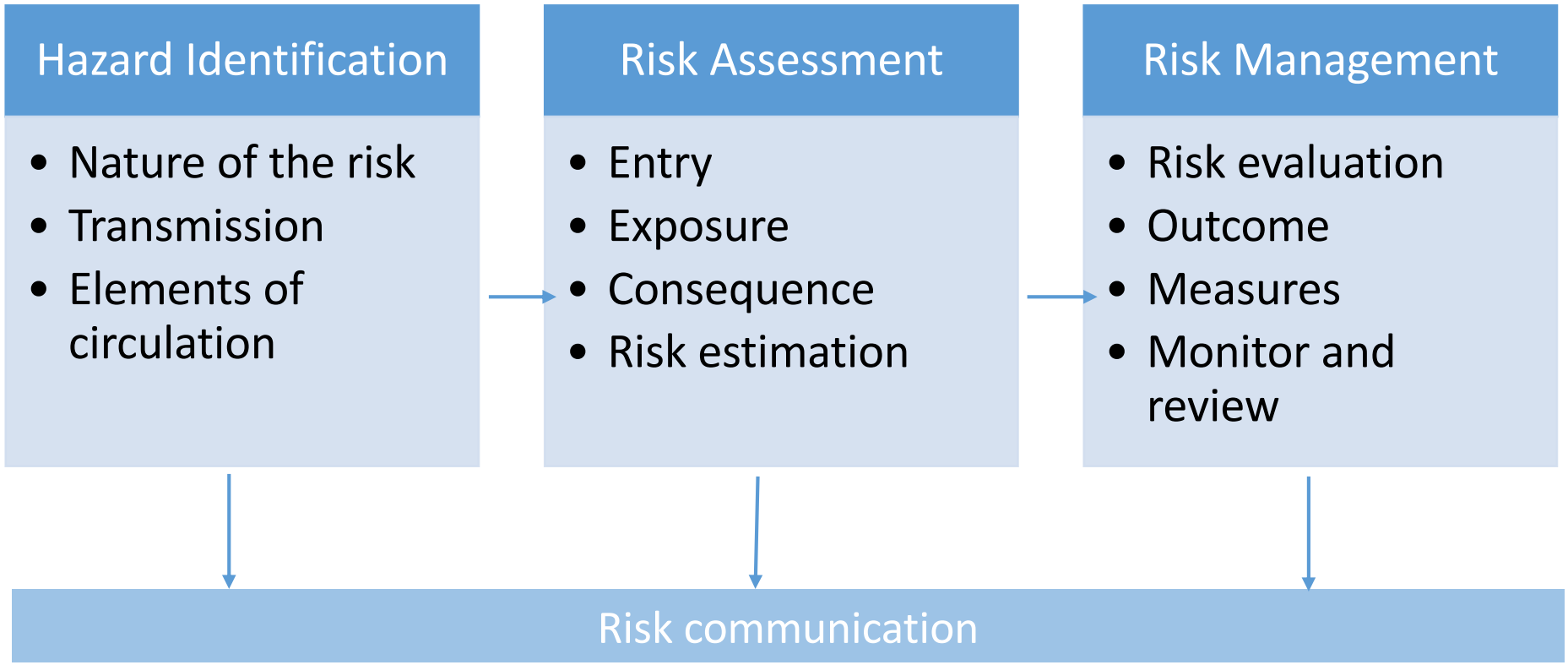
- Infrastructure, building, fences, …
- **Hardware component**

Mindset and attitude

- Procedures, implementation, monitoring, verification
- **Software component**

Substance

- **Can biosecurity eliminate the disease?**
- **Reduce** the risk of transmission
- In order to completely eliminate the disease you have to **manage the risk**



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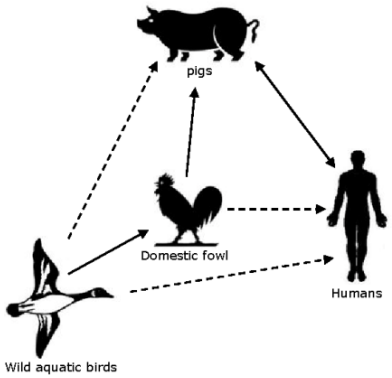
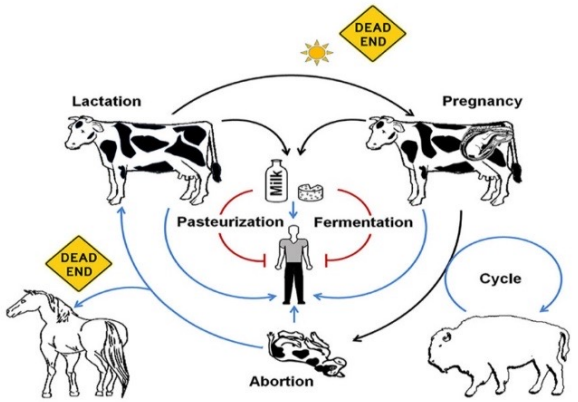
Identify the risk

- Nature of the risk
- Transmission
  - Direct transmission (introducing animals, contact with wild animals, borrowing animals)
  - Indirect transmission (feed, water, workers, veterinarians, visitors, equipment…)
- Elements of circulation





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Assess the risk

Likelihood vs Consequences

		Consequence				
		Negligible	Low	Moderate	High	Very high
Likelihood	Very high	Moderate	Moderate	High	Very high	Very high
	High	Low	Moderate	Moderate	High	Very high
	Moderate	Low	Low	Moderate	High	High
	Low	Negligible	Low	Moderate	Moderate	High
	Negligible	Negligible	Low	Low	Moderate	Moderate

Very high	Occur frequently
High	Has occurred before, will occur again
Moderate	Possible but not common
Low	Could occur but is not likely
Negligible	Has never occurred before and is very unlikely to occur

Risk level	Action
Very high	Urgent attention
High	Intervention required
Moderate	Active management
Low	On-going monitoring
Negligible	Acceptable risk

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Basic principles

- Segregation
  - Cleaning
- Disinfection

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Brainstorm

- Ask the visitors to park outside the farm
- Ensure that dirt from the vehicles that enter the farm is removed
- Build a fence around the farm
- Build second fence around the farm
- Ask the truck driver not to exit the vehicle
- Ensure that veterinarian is using new needles for collecting blood
- Use separate unit for new animals on the farm

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Segregation

- Prevent contact
- Applying physical barrier
- In time
- Examples
  - Fence
  - Restricting access
  - Separate equipment
  - Not sharing equipment
  - Separate workers
  - Quarantine
  - Secure source

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Cleaning

- Mechanically remove all the dirt
- Remove the movable object
- Use water and soap
- No visible dirt should remain
- Proper cleaning **can remove** very high percentage of the pathogen
- Detergents are recommended
- Organic matter can protect pathogen

Disinfection

- After the cleaning
- Approved disinfectant
- Applied in accordance with the instruction of the manufacturer
- Safety rules for personnel, environment and equipment
- Rinse after disinfection

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Biosecurity plan

- The biosecurity plan should:
  - Identify the risk/hazards
  - Establish procedures
  - Define the responsibilities
  - Ensure implementation
- Mindset is more important than the infrastructure
- Do not look your farm as an isolated island
- Same plan does not fit all establishments
- Update the BP when necessary

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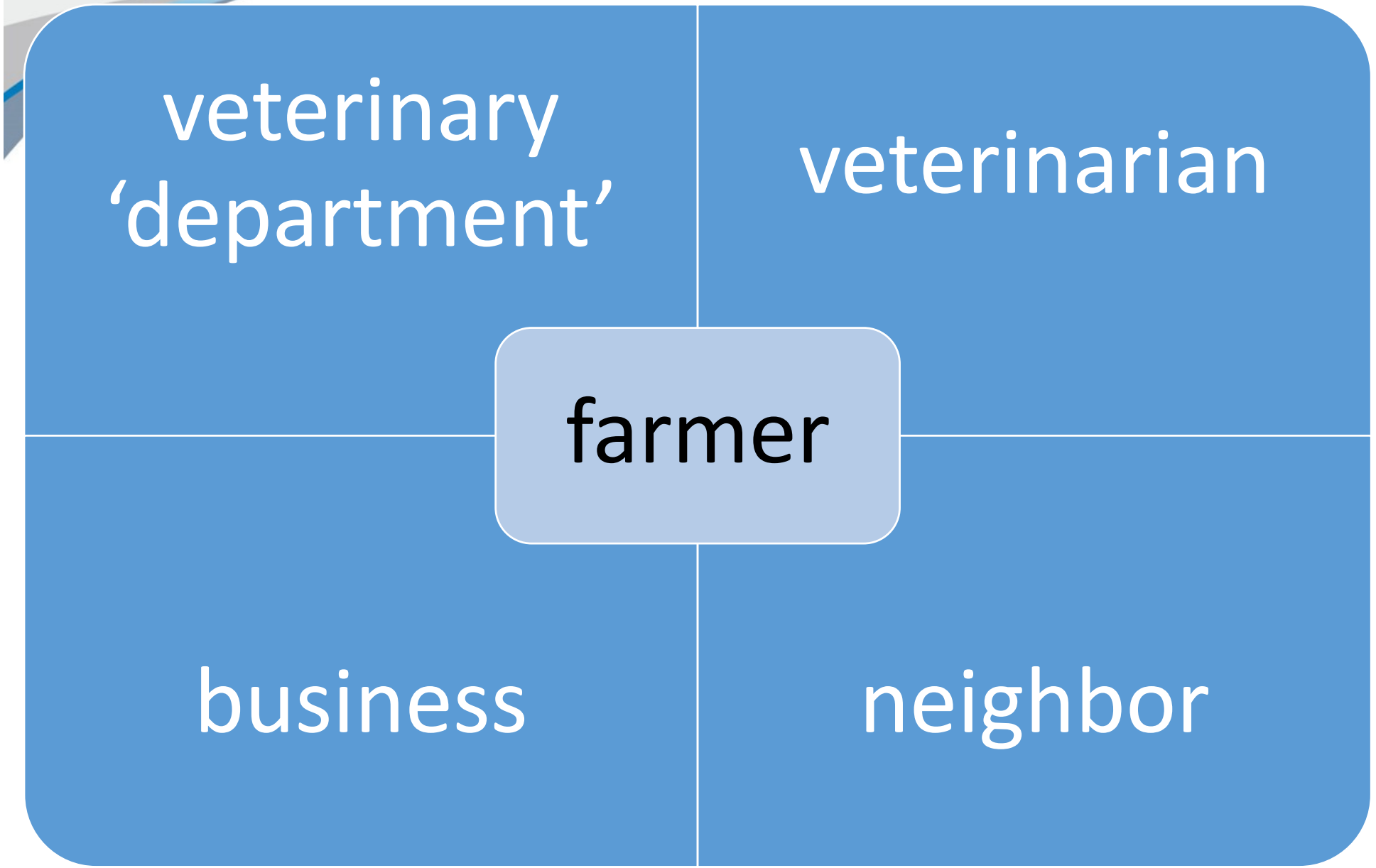
Stakeholders

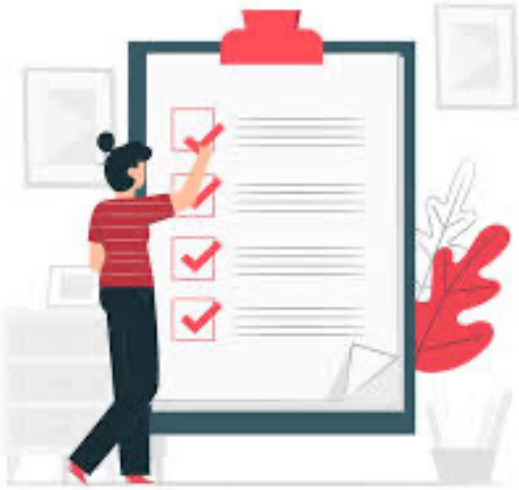


Regulation (EU) 2016/429 - Article 10

- **Management measures**, which may include:
  - procedures for entering and exiting the establishment for animals, products, vehicles and persons;
  - procedures for using equipment;
  - conditions for movement based on the risks involved;
  - conditions for introducing animals or products into the establishment;
  - quarantine, isolation or separation of newly introduced or sick animals;
  - a system for safe disposal of dead animals and other animal by–products.

Procedures principles

- Procedures should be risk and evidence based
- Identify the purpose
- Be pragmatic and realistic
- Be strict in implementing measures
- Adjust the frequency
- Monitor, verify and improve



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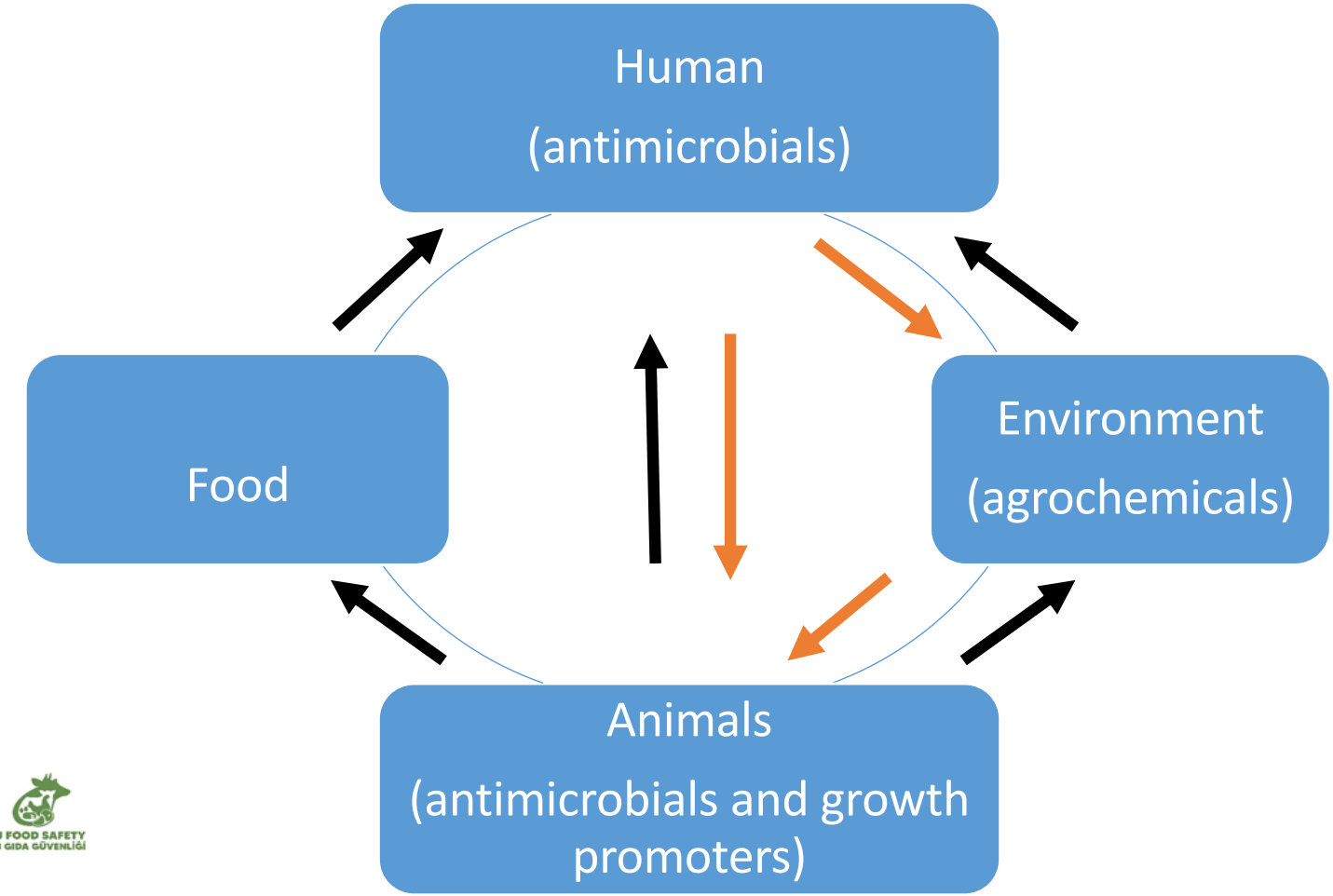
Why is prudent use important?

- Bacteria become resistant to antimicrobial
- Transmission of the antimicrobial resistant bacteria



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Exercise

- How many sick animals did you treat in the last 12 months?
- Do you use antimicrobials?
- Where do you get information on which antibiotic to use?
- If the antibiotic is expired, what do you do?
- Do you agree with the following:
  - ✓If the symptoms are improving, you should stop giving antibiotics!
  - ✓Using vaccines can prevent using antibiotics!
  - ✓Antibiotics can be simple discard because do not influence the environment!
  - ✓If the antibiotic does not work, you should use a higher dose or for a longer time!
  - ✓Using antimicrobials in animals can not affect human health!

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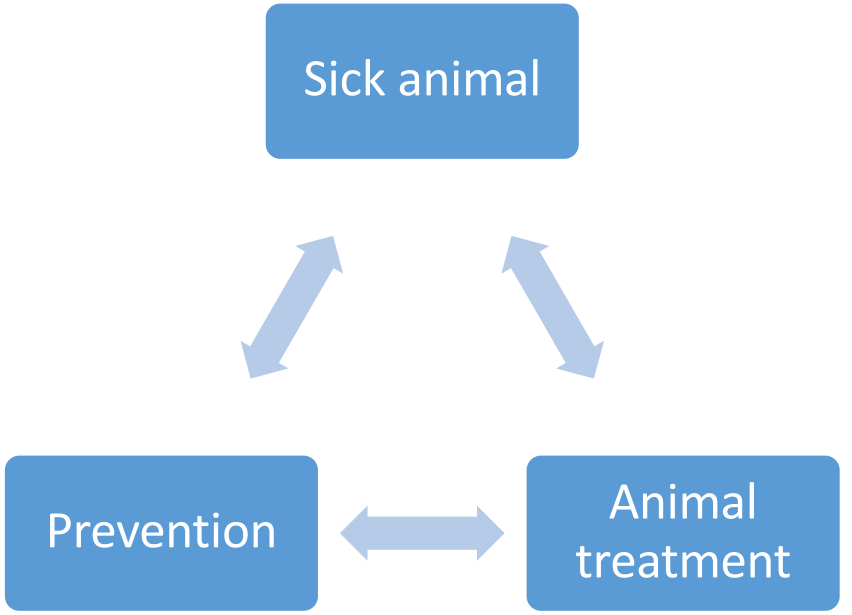
Treating sick animals

- **Problem:**
  - Overuse of antimicrobial
  - Missus of antimicrobial
- **One of the solutions:**
  - Prudent use of antimicrobials by veterinarians and farmers
- **Other solutions**
  - Good husbandry
  - Observed animal welfare
  - Effective biosecurity



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Good husbandry practices

- safe, clean and comfortable housing and manure management;
- all-in/all-out system; adequate space allowance with no over-stocking;
- good lighting and air quality through appropriate ventilation;
- appropriate temperature (adapted to animal species and age);
- quarantine possibilities for sick animals (pigs);
- nutritious feed (good hygienic quality, adequate amount and nutrient content);
- free/continuous access to clean drinking water;
- regular veterinary advice on disease prevention, animal health programmes, and treatment regimens;
- observance of stress behaviors in animals and taking measures to reduce those behaviors;

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Prudent use of antimicrobials

- Prudent use of antimicrobials should lead to more **rational and targeted use**
- The final outcome of prudent use should be an **overall reduction in the use of antimicrobials**,
- Prudent use in short:

how to?	at the same time …	synonyms
use of antimicrobials to benefits the patient	**minimizes the probability of adverse effects**	**judicious, rational, adequate, correct and optimal**

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Principles for prudent use - 1

- The **prescription** and dispensation of antimicrobials must be **justified by a veterinary diagnosis.**
- **Follow clinical examination** of the animal by the prescribing veterinarian. Where possible, **antimicrobial susceptibility testing.**
- **Antimicrobial metaphylaxis** (group treatment of animals when a disease is detected) should be used only when there is a **real need for treatment.**
- **Routine prophylaxis** (preventive treatment) **must be avoided**. Prophylaxis should be reserved for exceptional case-specific indications.
- **Sick animals** should be isolated and treated individually (e.g. by administrating injectables).
- A **narrow-spectrum antimicrobial** should always be the first choice.
- **If recurrence happen, determining why the disease is recurring**, and altering the production conditions, animal husbandry and/or management.

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Oral administration via feed and drinking water

- The quantities of antimicrobials administered in feed or water should be monitored and **documented** on a continuous basis, especially in intensive food production systems. Be aware that sick animals have decreased appetite.
- The **instruction** given in the product information (SPC, leaflet, labelling) and by the veterinarian must be complied with, both in terms of **dosage and duration** of treatment.
- Where an antimicrobial is administered through **feed**, it is important to ensure the **homogeneity** of distribution of the drug, in order that each animal obtains the required therapeutic dose for treating the disease in accordance with the veterinary prescription.
- **Off-label** (cascade) use should be limited to the necessary minimum and to **exceptional occasions** where no other authorised treatment options are available.
- Adequate, **clean storage facilities** should be available on the farm to ensure proper storage of the medicated feed. Access to these facilities should be restricted.

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Feed and drinking water

- Feed contaminants can be:
  - ✓Physical
  - ✓Chemical
  - ✓Biological
- Always check feed supply for signs of contamination including changes in color, smell, texture, or appearance, or presence of foreign objects.
- Buy feed only from reputable sources that have a quality control program.
- Save a feed sample and record the date of each feed purchase or delivery, so feed can be tested for contaminants at a later time (if needed).
- Check feed shipments for contaminants (e.g., rodent droppings, insects, mold, foreign materials) and evaluate whether feed is safe for consumption.
- Wash hands before and after handling feed.

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Feed and drinking water

- Feed should be safely and securely stored.
- Store concentrates in labeled bins or containers with tight-fitting lids to prevent access by rodents, birds, or wildlife, preferably in metal containers. If those are stored in original bags, keep them in closed storage.
- Cover feed during transport to prevent contamination. Protect feed stored on the farm, like hay or silage, from rain or snow.
- Feed spills should be cleaned up immediately since they attract vermin, like rodents, and wildlife.
- Implement a rodent control program. Use traps or baits to eliminate rodents in feed storage areas.
- Pasture management is also important, pasture can be source of parasites and other diseases.
- It's best to have dedicated equipment for storing, handling, and preparing feed. If equipment must be used for multiple purposes, or shared between sites, it must be thoroughly cleaned and disinfected before using for feeding.

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Feed and drinking water

- Do not feed directly on the ground: use feeders, troughs, or bunks and keep the ground around them clean and dry. If fed on the ground, it shall be on concrete which shall be clean, even and even covered with epoxi.
- Place feeders and waterers up high so that animals cannot step into them or urinate or defecate in them.
- Clean feeders regularly to prevent the buildup of manure and debris.
- Do not put new feed on top of old feed, remove the old feed.
- If possible, water quality and safety should be tested at least once per year.
- To prevent contamination, keep animals away from places where they could urinate or defecate in surface water.
- If waterers contain algae/biofilms or are contaminated with manure they should be scrubbed and cleaned with detergent, then disinfected with bleach.

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Farm hygiene milk contamination

- **Animals that produce milk need to be healthy!!!**
- Milk can be contaminated at any point in the milk production process.
- It is the responsibility of the food business operator (milk producer) to identify these points and implement control measures to protect milk from contamination.
- Raw milk is primarily intended for processing into dairy products which meet specified standards. Therefore, the quality and safety of raw milk is important in the production of high-quality milk products.

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Milking hygiene

Contamination of raw milk at the farm occurs during milking and handling. The sources of contamination include:

- The milking animal
- Personnel - Personnel hygiene
- Equipment
- Environment
- Water

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Milking hygiene

Ensure milking area is kept clean

The milking area should be designed to allow it to be kept clean and tidy. It should:

- be easy to clean;
- have a clean water supply;
- have waste handling facilities; and
- have sufficient temperature regulation, ventilation and light.

Construct holding yards to enable a high standard of cleanliness to be maintained.

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Milking hygiene

Preparing the udder for milking:

- removal of rough dirt from the udder with tepid water;

- disinfecting the udder with a disinfecting solution;

- drying the udder with paper towel/tissue;

The first milk spurt should be always milked in a separate container (same container for all cows) with dark surface to check the milk colour and consistence. In case of suspicion California Mastitis test can be used to verify mastitis.

After milking post milking teat dipping shall be used to prevent mastitis, animals shall receive fresh feed to prevent them to lay down.

Milking hygiene

Cleaning of milking equipment:

New milk filters shall be used for each milking.

- On farms with automatic milking system and CIP cleaning:
  - ✓ After milking CIP process shall be used according to the intructions of the manufacturer.
  - ✓ After the CIP the milking cups shall remain plugged until the next milking.
- On farms with non-automatic milking

<u>Before milking</u>:

- Disinfecting the milking machine, preceding immediately to milking, with a disinfecting solution;
- Disinfecting the milk collecting containers with a disinfecting solution, prior to milking;

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Milking hygiene

After milking:

- Immediately after milking, the milking machine and other containers used during milking, should be rinsed with lukewarm water until the water becomes clear (until clean and pure water is seen).
- After that, an alkaline solution should be prepared (50 - 70 g./10 l. water) and used to wash and rinse the entire equipment. Its temperature should be 60-70 ^{O}C. Proper cleaning brushes should be used for the washing, and no sponges. The rubber parts of the milking machine should be cleaned in the same manner.
- After washing with an alkaline detergent, the entire equipment should be rinsed with a gushing water to ensure elimination of any alkaline detergent residue.

This procedure should be repeated every day!

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Milking hygiene

Regular maintenace of the milking machine:

• Vacuum and pulsation rate shall be regularly checked by a technician. Non appropriate vacuum and pulsation can decrease milk production and also harm the teats of the animals.

• Rubber parts shall be replaced regularly according to the instructions of the manufacturer. Abused, cracked milking cups can’t be effectively cleaned and can also cause mastitis.

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Storage tanks

- ✓Milk house shall be regularly cleaned and disinfected, fly nets shall be applied to keep flies away.
- ✓Storage tanks must be sited and maintained so as to limit the risk of contamination of the milk.
- ✓Storage tanks shall be CIP cleaned after delivering of milk.
- ✓Storage tanks must be adequately sealed to prevent physical contamination of milk, especially the lids for taking of milk.
- ✓If milk is taken every day, it shall be kept below 8^{o}C, if only every second or third day, under 6^{o}C

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Conclusions

- Farm Biosecurity and Farm Hygiene ensures that the milk is produced by healthy animals and produced raw milk is safe.
- Dairy farmers are an integral part of a larger dairy food production and processing chain and that all participants in the chain - dairy farmers, suppliers to dairy farmers, dairy product manufacturers, should be part of an integrated food safety and quality assurance management system.

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DISCUSION AND QUESTIONS
THANK YOU FOR YOUR ATTENTION

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