



Collaborating Centre
*for Veterinary Training, Epidemiology,
Food Safety and Animal Welfare*



Reference Centre
Veterinary Epidemiology

Training opportunities for veterinary services in the Mediterranean basin

Barbara Alessandrini



The Mediterranean sea is the heart of our activities

- 
- Same history, same problems
 - To catch the challenge for change
 - Veterinary cooperation
 - For a safer market
 - Food safety
 - food security
 - consumers' health



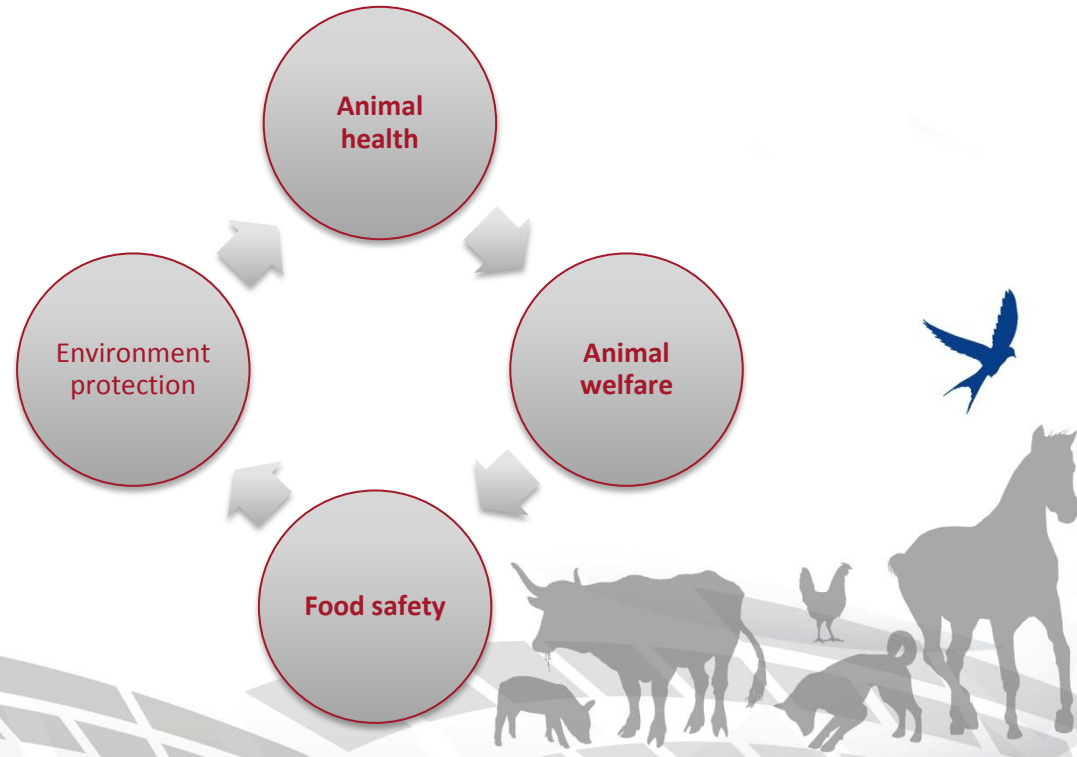


- Collaboration
- ↓
- Knowledge networks
- ↓
- Transparency
- ↓
- Knowledge sharing
- ↓
- Trust
- ↓
- Capacity building



Some key aspects

- 
- Knowledge and innovation production and sharing is our duty,
 - also in non EU countries from where we import animal products.





IZSAM G. CAPORALE
TERAMO



Collaborating Centre
for Veterinary Training, Epidemiology,
Food Safety and Animal Welfare

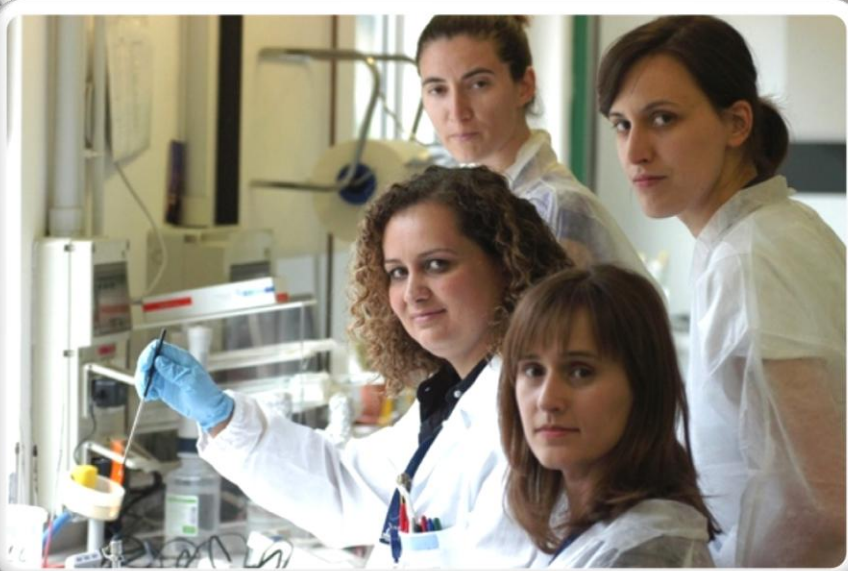


Reference Centre
Veterinary Epidemiology

Residential training



Laboratory training



In-country training





Collaborating Centre
for Veterinary Training, Epidemiology,
Food Safety and Animal Welfare



Reference Centre
Veterinary Epidemiology



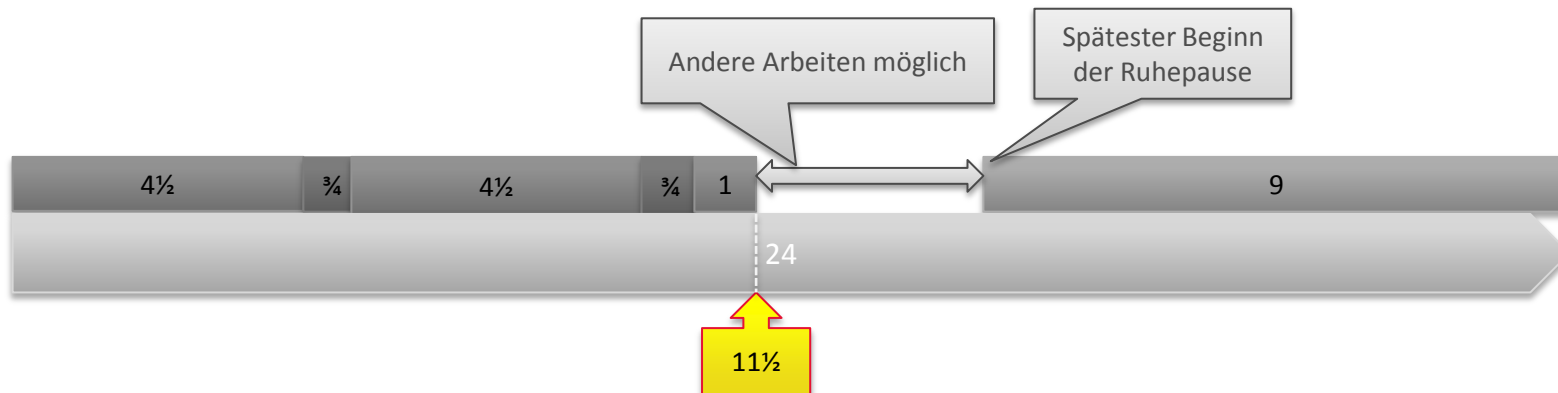
eLearning



Lektion 4: Umgang mit den Tieren während des Transportes

Fahrzeiten (Teil 1)

Innerhalb einer 24-Stundenperiode kann eine einzige Person nur für 11 ½ Stunden als Fahrer gezählt werden, diese Zeit beinhaltet Pausen



Veranschaulichung der 1-Fahrer-Regelung in Übereinstimmung mit Verordnung (EG) 561/2006

- Grün = Fahrzeit
- Lila = Pause
- Rot = Ruhepause
- Blau = Berechnungszeitraum
- Gelb = maximal mögliche Zeit als Fahrer



Ενότητα 1: Εισαγωγή

Σημεία Ελέγχου



Με την εφαρμογή της Οδηγίας 95/29/EC, οι μεταφορές των ζώων εντός Ε.Ε. έχουν περιοριστεί σημαντικά σε ό,τι αφορά τη διάρκεια ταξιδιού για τα κυριότερα είδη ζώων (άλογα, βοοειδή, αίγες, πρόβατα, πουλερικά και χοίροι).

Μετά από ένα συγκεκριμένο χρόνο **οδικής μεταφοράς των ζώων** (έως 29 ώρες για τα μηρυκαστικά και 24 ώρες για τους χοίρους και τα άλογα), τα ζώα πρέπει να εκφορτώνονται για 24 ώρες σε εγκαταστάσεις εγκεκριμένες από τις Αρμόδιες Αρχές.

Παρόλο που η δομή της σημερινής Νομοθεσίας για τις μεταφορές των ζώων έχει ανασχεδιαστεί με την εφαρμογή του Κανονισμού (ΕΚ) Νο 1/2005, όλοι οι κανόνες που αφορούν τους χρόνους ανάπαυσης των ζώων έχουν διατηρηθεί.

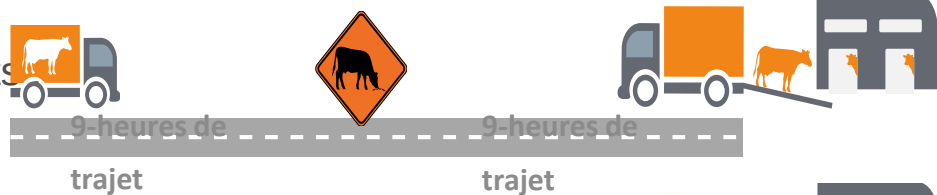


Unité 2 : Cadre réglementaire et de licence

Règlement du Conseil de l'Europe (EC) 1/2005

Durée des transports de plus de 8 h pour les bovins et les porcins avant déchargement dans le poste de contrôle :

Veaux non sevrés* et porcelets



Autres porcins :



Autres bovins :



La pause de 1 heure permet de donner à boire aux animaux et si nécessaire de les alimenter. Après les durées de transport indiquées, les animaux doivent être déchargés, alimentés et abreuvés, et mis au repos pour au moins 24 heures → **Poste de contrôle**

Dans l'intérêt de l'animal, la durée du trajet peut être rallongée de deux heures, notamment en cas de proximité du lieu de destination.

***Non sevrés** signifie que l'animal n'est pas capable d'assurer son équilibre métabolique en subvenant par lui-même à ses besoins en fourrage et eau.



Unit 6: Logistics and facilities of CPs

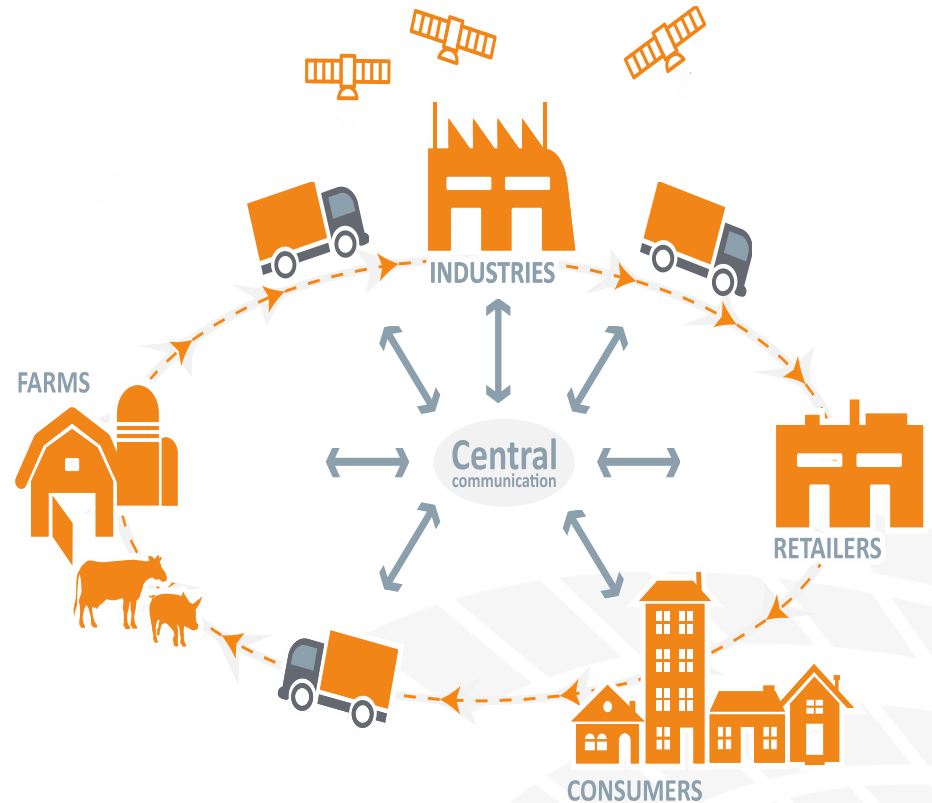
Organising transport

At farm level

- preparation for transport;
- definition of responsibilities between farmers and drivers;
- loading facilities and methods.

Vehicle and during transport

- adequate ventilation system in the vehicle:
 - sufficient openings for natural ventilation to avoid hot spots;
 - mandatory to install a mechanical ventilation system with sufficient capacity and alarm system for the driver;
- space allowance;
- access to water and feed;
- improved driving performance;
- route planning;
- automated monitoring and control facilities, also during loading and unloading.





Unidad 2: Marco legislativo y licencias

Reglamento (CE) 1/2005



Reglamento (CE) 1/2005 es sobre "la protección de los animales durante el transporte y operaciones relacionadas.

El presente Reglamento regula:

Documentación de transporte

Autorización de transporte en general y para viajes largos

Revisión por la autoridad competente

Certificado de competencia para los conductores y asistentes

Aprobación de los medios de transporte

Aptitud para el transporte

Prácticas de transporte

Intervalos de alimentación y dar agua

Tiempos de viaje y los intervalos de descanso

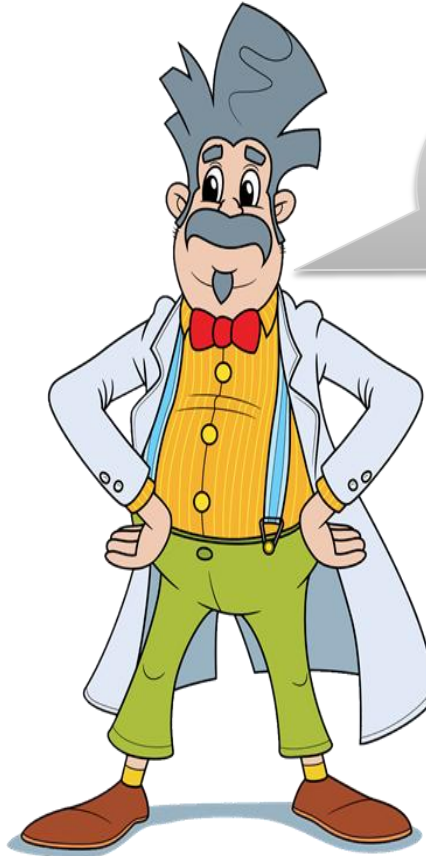
Asignación de espacio

Suplementos específicos para viajes largos*

* "viaje largo" significa un viaje que exceda de 8 horas, a partir de cuando se mueve el primer animal de la partida!



3 الوحدة



الأمن البيولوجي
و المخاطر
الصحية



الأمن البيولوجي و المخاطر الصحية :3الوحدة

مقدمة للمخاطر البيولوجية في نقاط التحكم



تتعرض الحيوانات لكثير من الضغوط أثناء النقل مما يؤدي إلى انخفاض المقاومة وزيادة القابلية للعدوى بالإمراض النقل يزيد من حدة و تكرار الاتصال بين الحيوانات مما للحد من مخاطر النقل و الإقامة . يؤدي إلى انتشار المرض في نقاط التحكم يجب مراعاة النقاط التالية:

يشير إلى جميع “الأمن البيولوجي” المصطلح التدابير المتخذة من أجل تقليل احتمال تفشي تهدف هذه التدابير بعناية لمنع .الإمراض المعدية انتشار الأمراض يتم تنفيذ هذه التدابير مربى الحيوانات، الأطباء البيطريين، السائقين والزوار

يجب مراعاة الأمن البيولوجي أو الحيوي في نقاط التحكم ليس فقط عندما تكون هذه النقاط قيد الاستخدام بل يستوجب الحصول على موافقة السلطات المختصة لوضع اعتبارات التخطيط و التصميم لضمان الأمن البيولوجي



الأمن البيولوجي و المخاطر الصحية :3الوحدة

مقدمة للمخاطر البيولوجية في نقاط التحكم

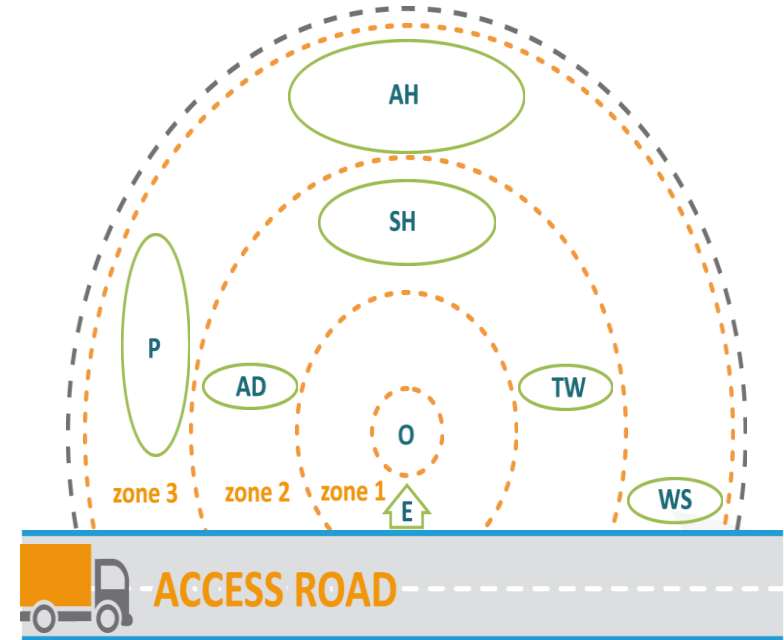
نقاط التحكم:

يستوجب تصميم و بناء نقاط التحكم بحيث توفر الأمن البيولوجي بصورة كافية (EC 1/2005).
لا يجب أن تؤوى الحيوانات إلا إذا اعتمدت حالتها الصحية .

تفريق بعد كل /يجب تنظيف و تطهير جميع الحظائر، سلاالم، الممرات و تحميل استخدام.

ساعة بعد رحيل الحيوانات المحتفظ 24 يجب تنظيف و تطهير جميع الحظائر خلال بها سابقاً وان تكون خالية من الحيوانات حتى تتم عملية النظافة و التطهير بحيث ترضي الطبيب المعتمد.

قبل (فواصل صحية) ساعة 24 يجب أن يتم مسح تماماً من جميع الحيوانات لمدة وبعد مدة (إلا إذا أتت الحيوانات من منطقة مماثلة و محصورة) وصول شحنة جديدة أيام استخدام 6 أقصاها.



E=Entrance
O=Office
AD=Accommodation for drivers
SH=Storehouse
P=Parking
TW=Truck wash
AH=Animal house
WS=Waste storage



الأمن البيولوجي و المخاطر الصحية :3الوحدة

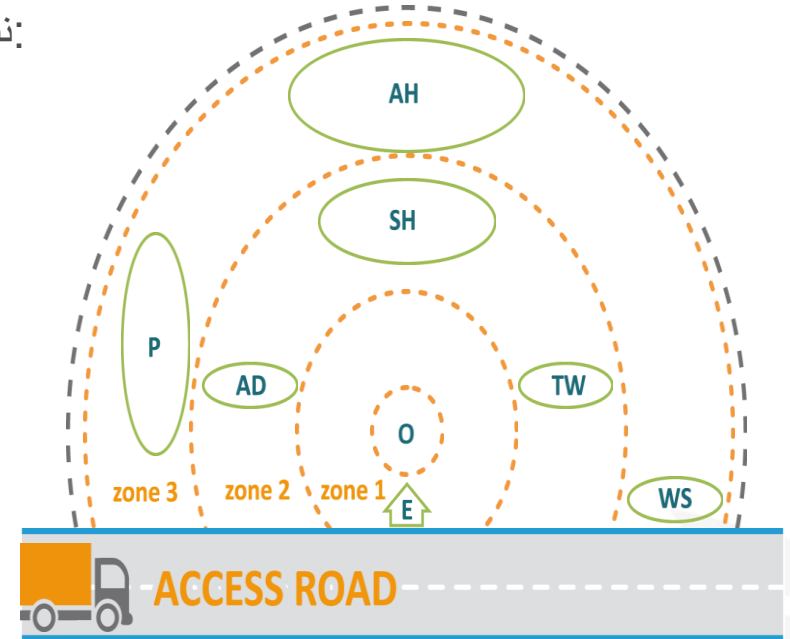
الموقع و تصميم البناء و نوع النماذج الموحدة

نقاط التحكم و تخطيط الموقع

إدارة الصحة الحيوانية . الموقع والتصميم من أهم العوامل ذات الأهمية المتزايدة وممارساتها هي اقل تكلفة لتغيير وذات تأثير مباشر على العمليات القائمة على الأمن البيولوجي.

المركبات و السطوح التي التي يسافرون عليها تساعد على نقل و انتشار العوامل المسببة للمرض و بالتالي من المهم السيطرة عليها وإذا لزم الأمر تغيير حركة المركبات في جميع أماكن العمل.

عند حدوث المرض، تمثل البيئة الطبيعية المحيطة عاملاً مهماً للحد من مخاطر إدخال الأمراض وانتشارها.



E=Entrance
TW=Truck wash
O=Office
P=Parking
AD=Accommodation for drivers
AH=Animal house
SH=Storehouse
WS=Waste storage



الأمن البيولوجي و المخاطر الصحية :3الوحدة

موقع و بناء النماذج الموحدة

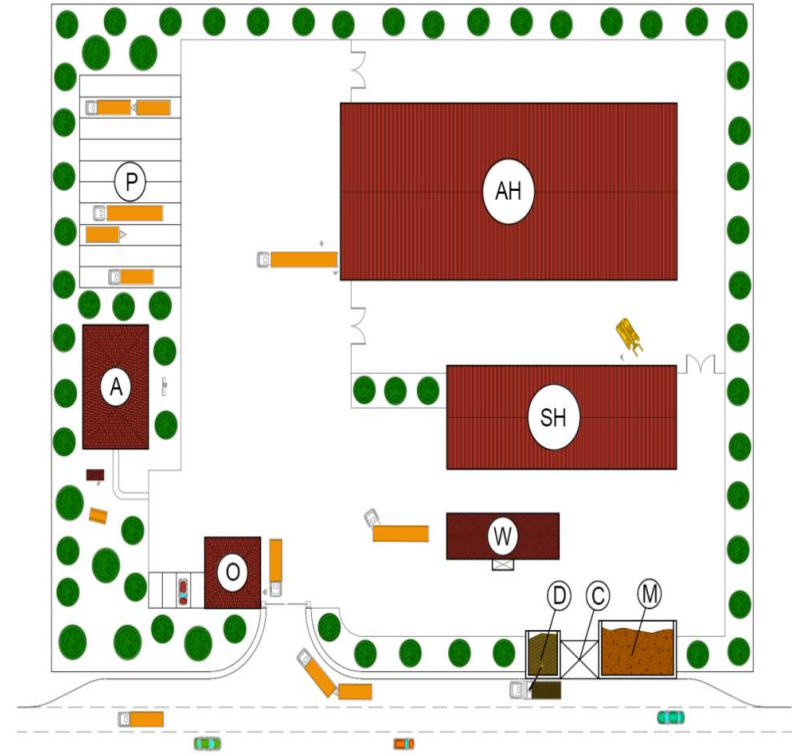
المشاهد الطبيعية والمناظر.

الميزات الطبيعية بما في ذلك النباتات، المجاري المائية و التضاريس تفيد الأمن الصحي من خلال توفير الحواجز الطبيعية استخدام الطبيعة لمساعدة الصرف و الحد من المياه الراكدة في مناطق الإنتاج.

تقليل الأشجار و الشجيرات قرب او داخل مناطق الإنتاج.

استخدام الحواجز الطبيعية على طول الطرق او حدود المزارع المجاورة لتعزيز الانفصال.

إدارة الغطاء النباتي في منطقة الإنتاج او حولها.

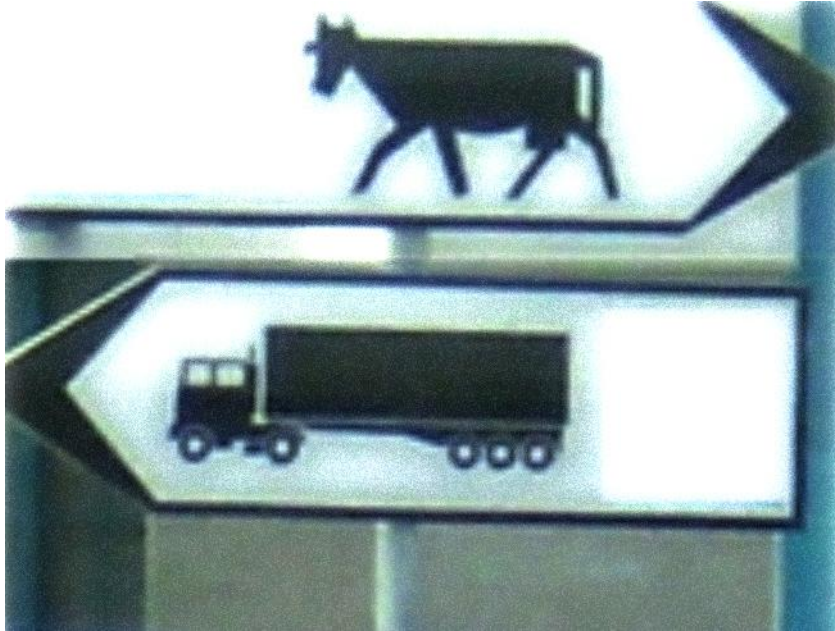


A=Accommodation for drivers; O=Office; AH=Animal House; SH= Store House; P=Parking; W=truck Wash; D=Differentiated waste disposal; C=Cadaver storage; M=Manure storage



الأمن البيولوجي و المخاطر الصحية :3الوحدة

لوجستية داخل نقاط التحكم لتجنب الاتصال بين الأنواع المختلفة في حركة السير

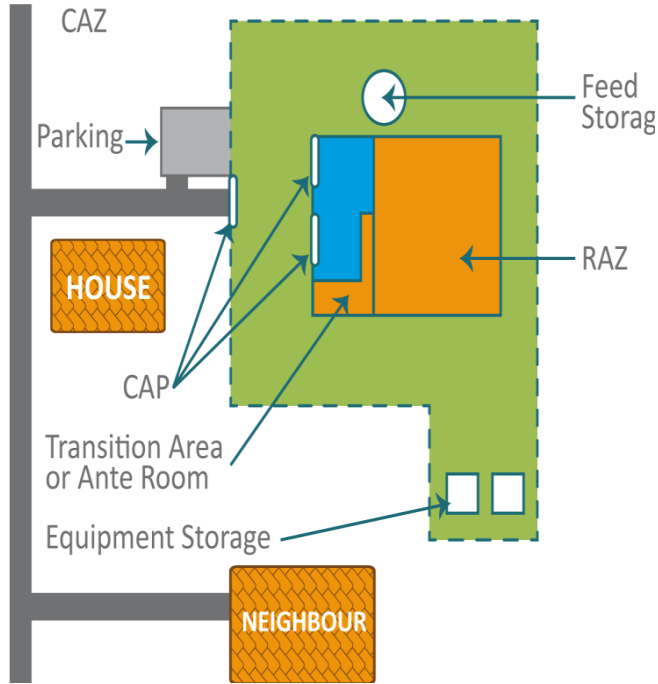


وسائل النقل هي احد العوامل في انتشار الأمراض مثل الحمى القلاعية لذا تمثل نقاط التحكم و حركة .(CSF)او حمى الخنازير الكلاسيكية (FMD) السير المختلفة تكون نقاط خطرة لنشر الأمراض لهذا السبب ينبغي نظافة مسار النقل بصورة منتظمة

على سبيل المثال نقل الغذاء و التخلص من النفايات)يجب فصل وسائل النقل إذا لم يتيسر الفصل يجب (الحيوانات و الأعلاف)ووسائل النقل الداخلي (الخ فصل وسائل النقل في الزمن



الأمن البيولوجي و المخاطر الصحية :3الوحدة تصميم نقاط التحكم الموقع و بناء النماذج الموحدة



:الحيوي-مناطق الأمن البيولوجي

مناطق الأمن البيولوجي هي المناطق التي تحتوي على تدابير حريصة من أثناء الدخول، الخروج و الحركة.

، **Controlled Access Zone (CAZ)** منطقة محكمة الدخول الدخول -
تمثل مناطق **Restricted Access Zone (RAZ)** ومنطقة الوصول المقيد
متزايدة الخطر و يجب أن تكون واضحة و مراقبة

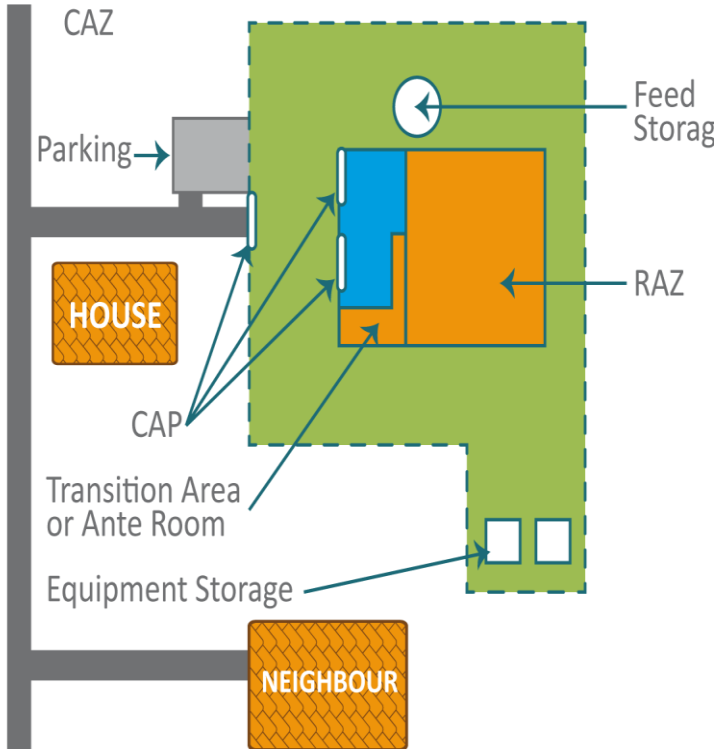
:النقاط الحرجة

و أيضا (منطقة الأمن البيولوجي الخارجي) CAZ يجب وجود
(منطقة الأمن البيولوجي الداخلي) RAZs وجود واحد أو أكثر
CAZ و ل RAZ. كما يجب توفير لافتات واضحة وملائمة ل
تحديد حدود مناطق الأمن البيولوجي
إدخال التحكم في مداخل و مخارج مناطق الأمن البيولوجي

مفهوم تخطيط المزرعة ودمج مناطق الأمن البيولوجي

الأمن البيولوجي و المخاطر الصحية :3الوحدة

تصميم نقاط التحكم الموقع و بناء النماذج الموحدة



(RAZ) هي المنطقة التي تسبق منطقة الوصول المقيد : ما قبل الغرفة مباشرة و تعتبر منطقة تحول تدريجي من منطقة التحكم في الدخول (CAZ).

مساحة الأراضي و المباني التي تشكل (CAZ) منطقة الوصول للرقابة منطقة الإنتاج و يمكن الوصول إليها من خلال نقطة مراقبة

يتم استخدامها CAZ وهي مساحة داخل (RAZ) منطقة الوصول المقيد لإيواء الحيوانات بما في ذلك شبه الحجز و مجموعة الإنتاج و حيث إن RAZ يشار إلى CAZ الأفراد و المعدات أكثر تقييداً مما هو عليه في و أحيانا على أنها منطقة الإنتاج المحظورة . بمنطقة الأمن الداخلي (RAZ).

للمزيد من المعلومات:

[الشروط العامة لفتح الحيوانات](#)
[فتح الحيوانات الحية](#)

المحتويات في عمق

مفهوم تخطيط المزرعة و دمج مناطق الأمن البيولوجي



Web based

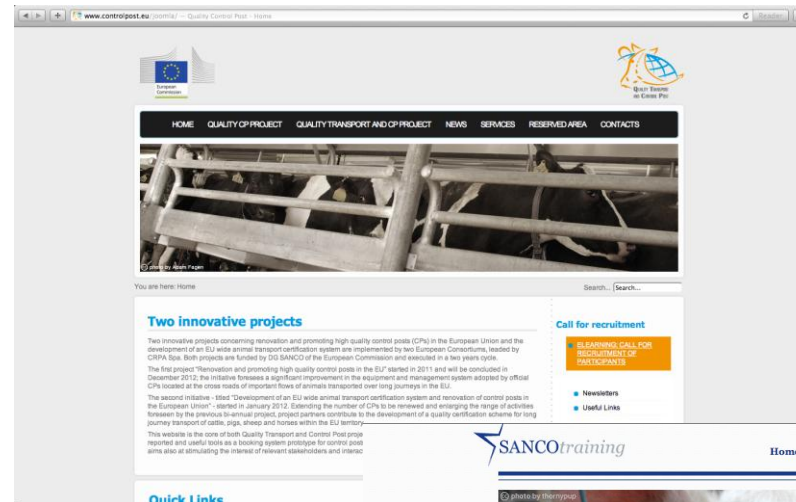
knowledge management

OIE Collaborating Centre
for Veterinary Training, Epidemiology,
Food Safety and Animal Welfare

FAO Reference Centre
Veterinary Epidemiology

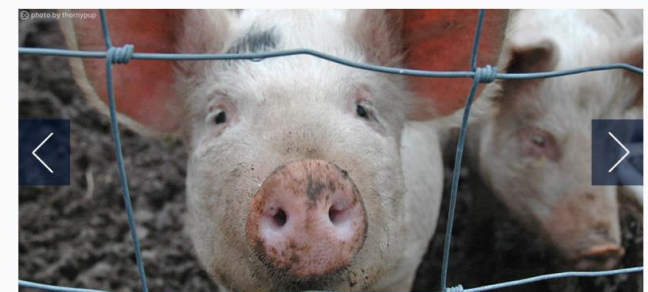


CALLISTO



SANCOtraining

[Home](#) [Training 2011/12](#) [Application Form](#) [Previous courses](#) [News](#)



Animal welfare concerning the farming of pigs
September 2012, Italy

Training Strategies

"Better Training for Safer Food" (BTSF) is a Commission initiative aimed at organising a Community (EU) training strategy in the areas of Food Law, Feed Law, Animal Health, Animal Welfare and Plant Health.

The main objectives of the initiative are to:

- Ensure and maintain a high level of consumer protection and of Animal Health, Animal Welfare and Plant Health;
- Promote a harmonised approach to the operation of Community and national control systems;
- Create an equal level playing field for all food businesses;
- Enhance trade of safe food;
- Ensure fair trade with third countries and in particular developing countries.

Search

Keywords

Latest News

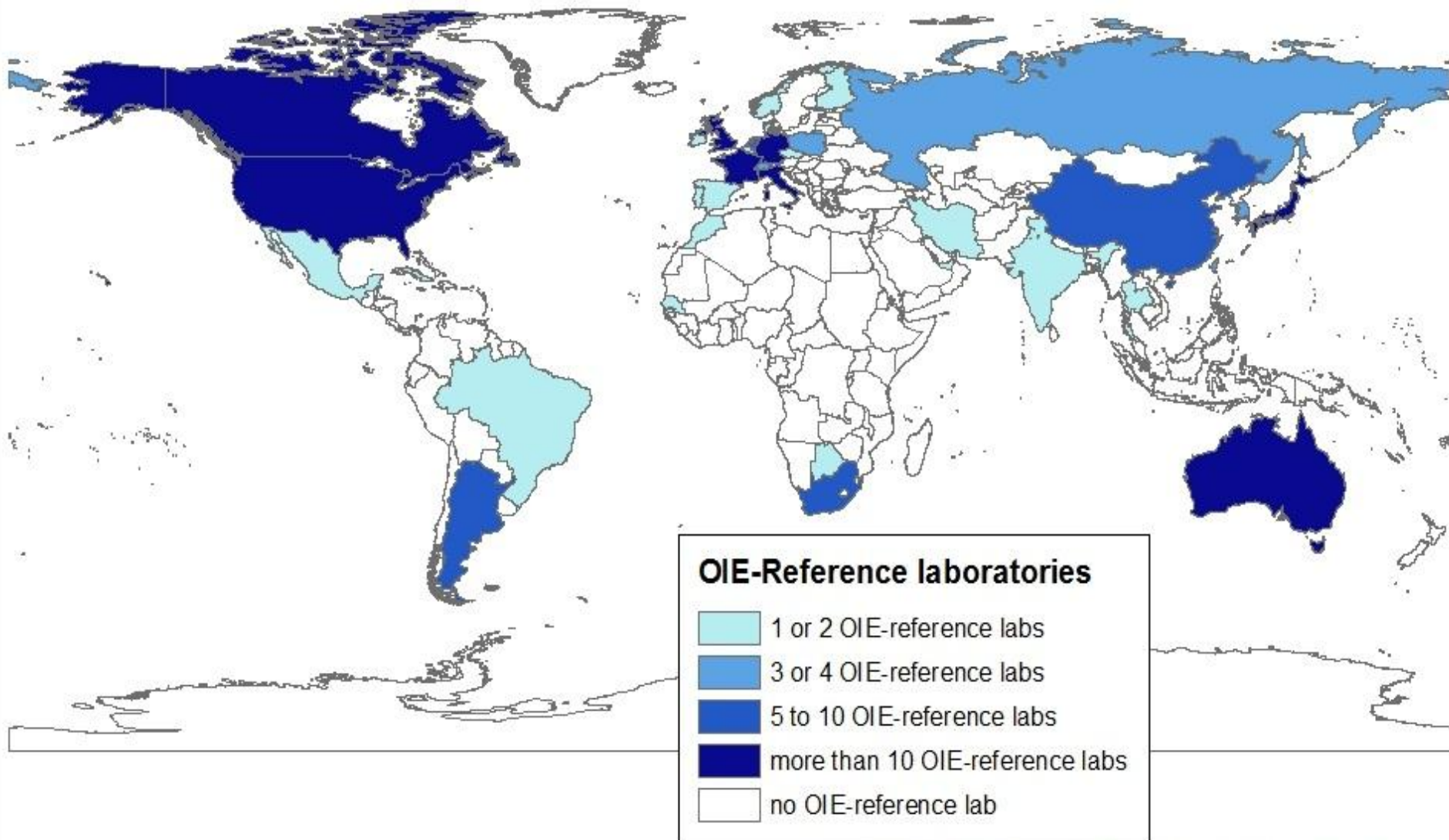
New website

June 25, 2012 Online the new website dedicate...

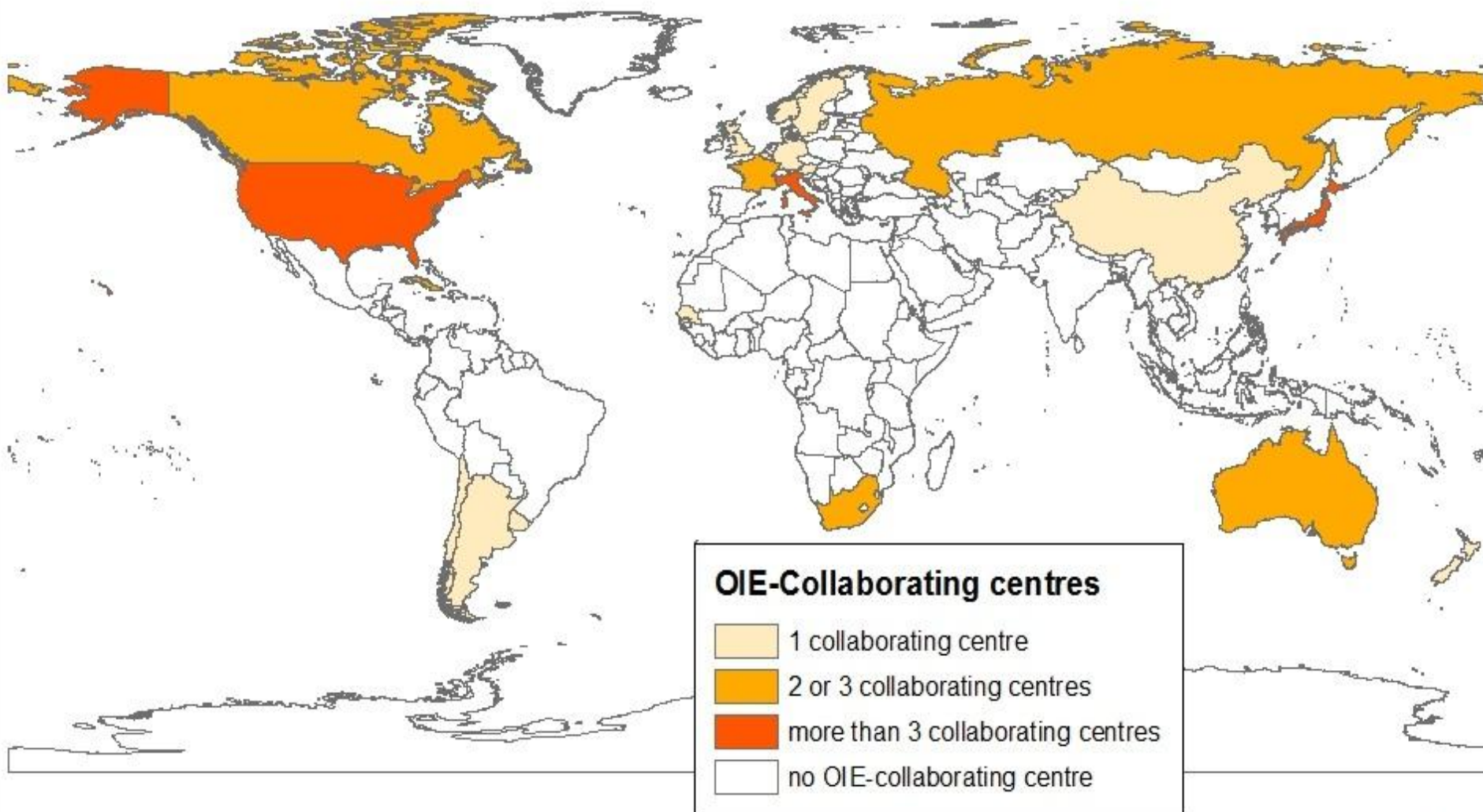
[Read More...](#)

World distribution of the OIE-Reference Laboratories

236 Reference Laboratories with 176 experts covering 112 diseases/topics in 37 countries



World distribution of the OIE-Collaborating Centres



Copyright © 2012, Animal Health Information Department – OIE

The Twinning concept: evolution



From..

- Sustainable improvement of competences and expertise linking a reference laboratory/collaborating centre to a national laboratory/centre

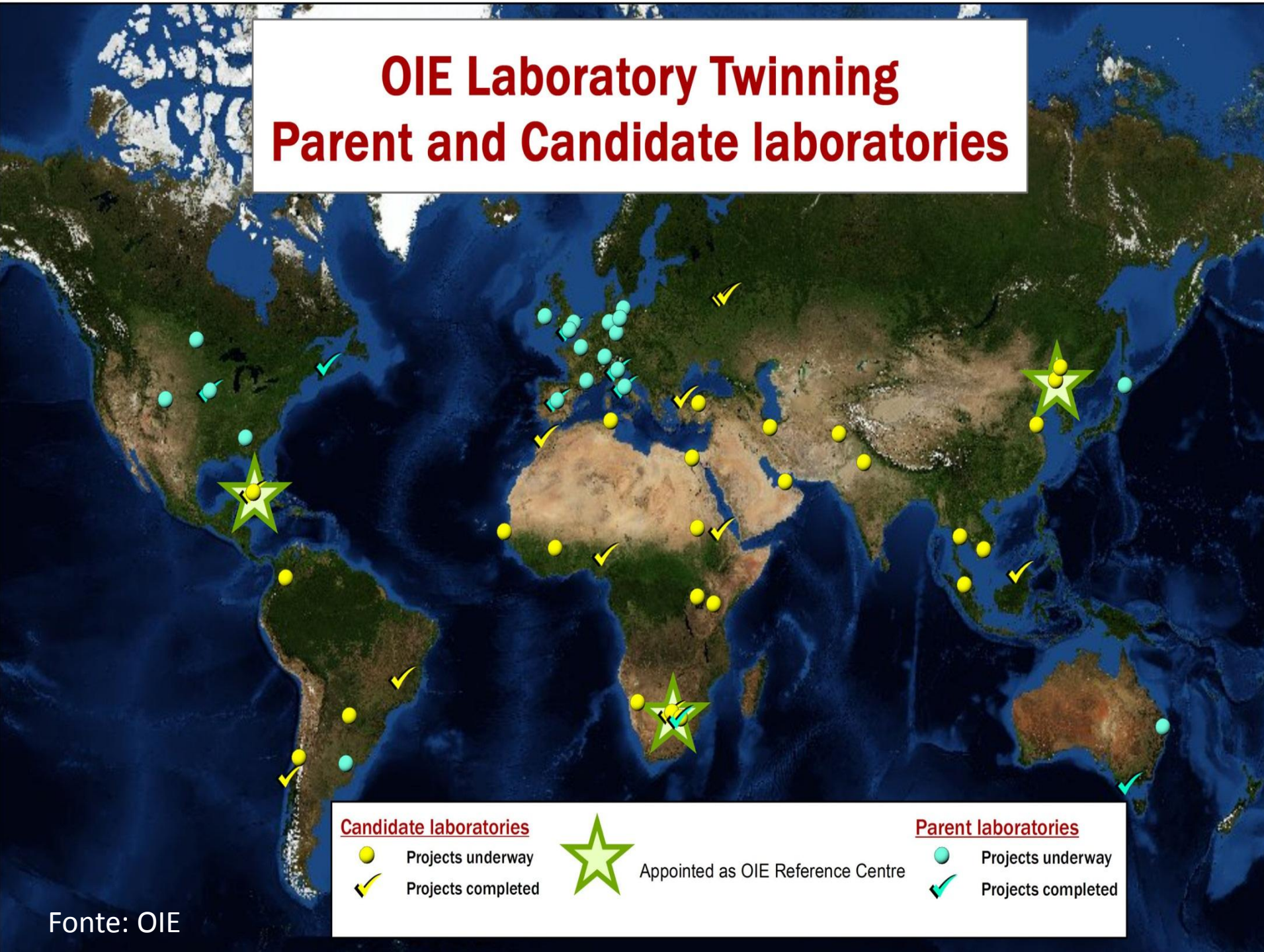
To

- Link and engagement of regional networks for disease control
- Support to neighbour countries
- Development of research opportunities

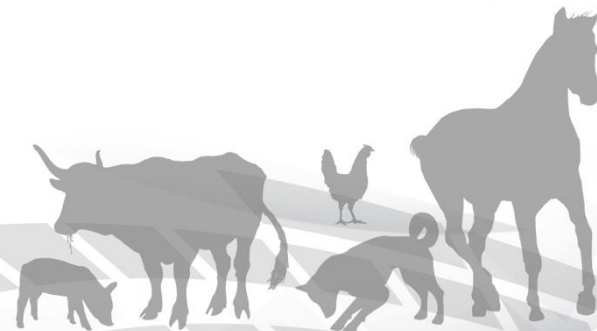
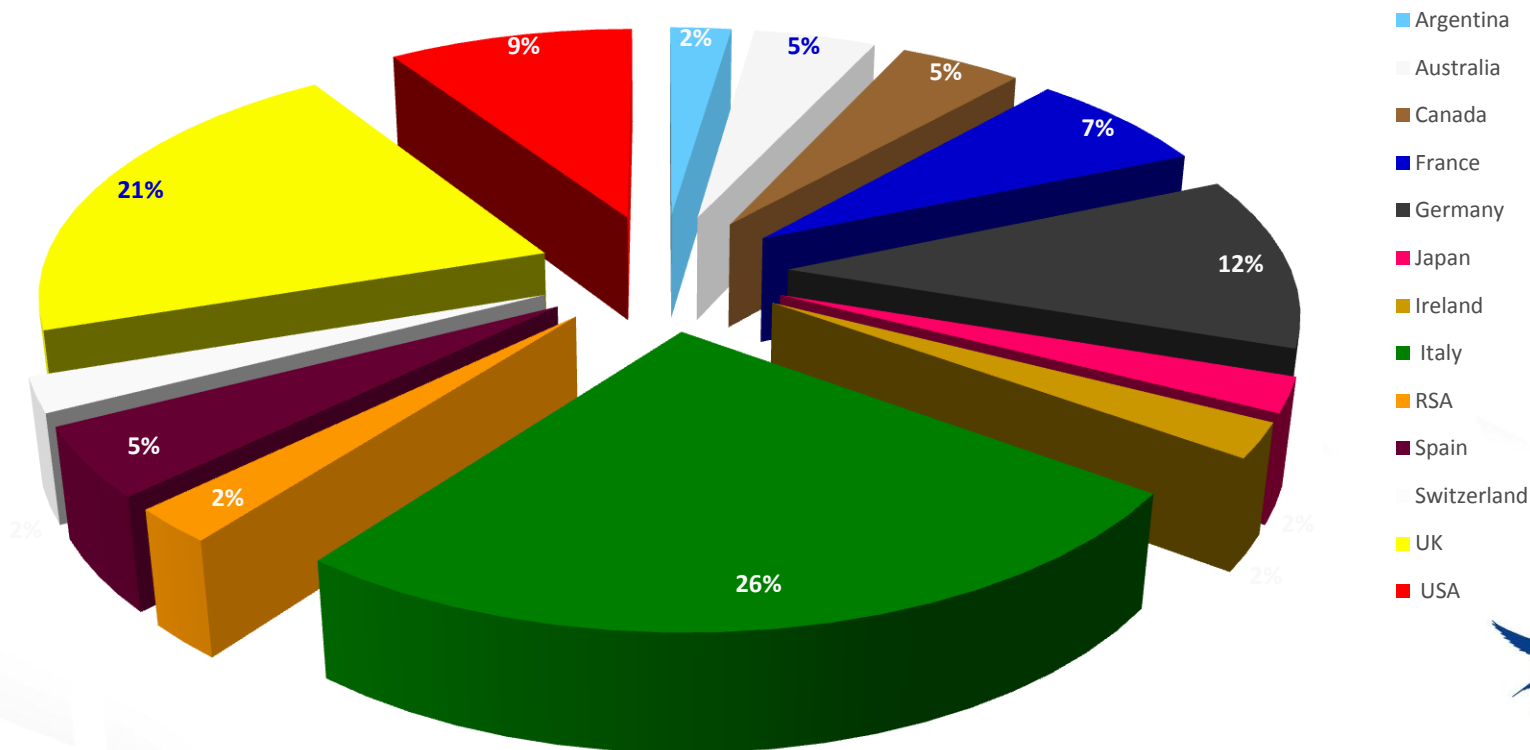


OIE Laboratory Twinning

Parent and Candidate laboratories



“Expert” Laboratories, 2013



Twinning projects in Italy

- AI and Newcastle disease

- I – Cuba
- I – Russia
- I - Iran

- Brucellosis

- I – Eritrea
- I – Kazakhstan
- I – Zimbabwe

- CBPP

- I - Botswana

- Food safety

- I – Tunisia
- I - Namibia

- WND

- I - Turchia

- BT

- I - Tunisia

- Epidemiology and mycoplasmosis

- I - Cuba

- Salmonellosis

- I - Vietnam





IZSAM G. CAPORALE
TERAMO

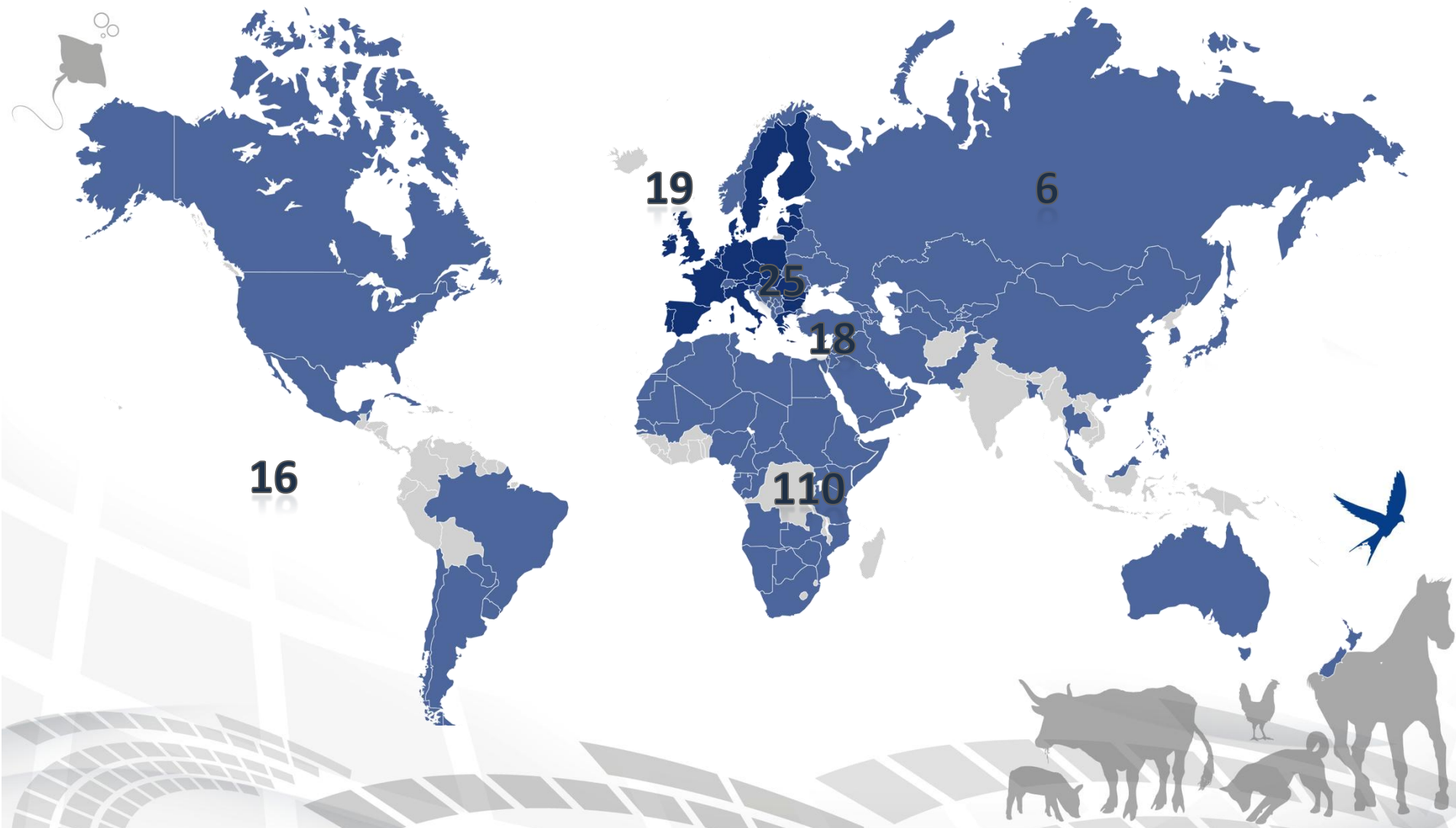


Collaborating Centre
for Veterinary Training, Epidemiology,
Food Safety and Animal Welfare



Reference Centre
Veterinary Epidemiology

2010-2013: 194 study visits





FAO Reference Centre

2014 Action plan

- 
- Training and capacity building in veterinary epidemiology and vectorborne diseases,
 - Development and support to implementation of animal traceability and animal health surveillance systems,
 - Development and support to implementation of Laboratory Information Management Systems (LIMS).





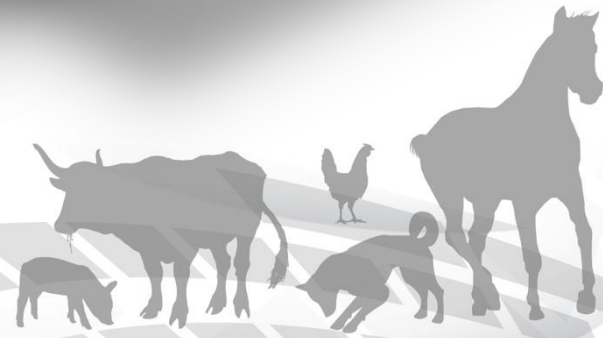
Collaborating Centre
for Veterinary Training, Epidemiology,
Food Safety and Animal Welfare

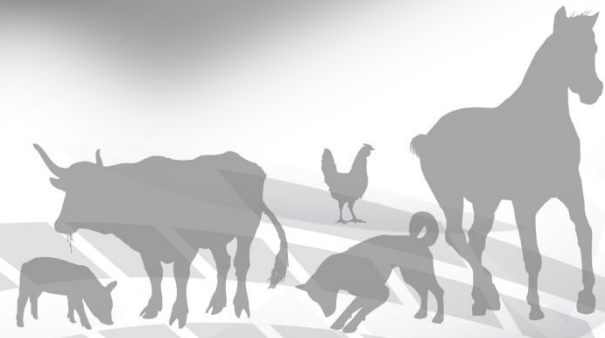


Reference Centre
Veterinary Epidemiology

Why eLearning and web based knowledge management?









Collaborating Centre
for Veterinary Training, Epidemiology,
Food Safety and Animal Welfare



Reference Centre
Veterinary Epidemiology

We can keep costs under control



Veterinary Epidemiology eLearning Course

Some basic probability ideas
// Probability distribution equations

Cumulative Distribution Function (cdf)
A cumulative distribution function has the following properties:

Bayes Theorem Example
// Probability distribution

Example 1
The following example illustrates the use of this equation. Three farms A, B and C produce 20%, 45% and 35% respectively of the eggs consumed in a town. 2%, 1% and 3% respectively of these eggs are contaminated with some Salmonella.

What is the probability that any randomly selected egg on sale in the town will be contaminated? Let X be the events that the egg is defective and A, B and C be the mathematics. Using simple chain rule probability.

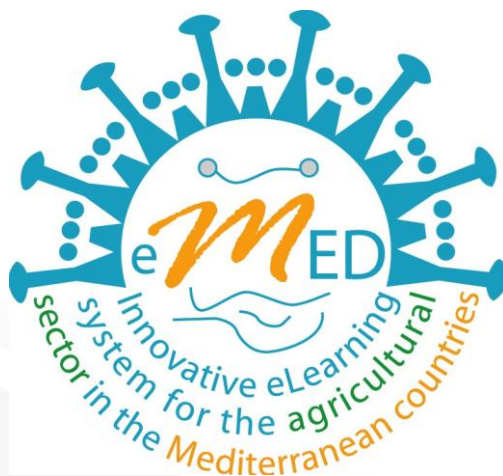
$P(X) = P(A) \cdot P(X|A) + P(B) \cdot P(X|B) + P(C) \cdot P(X|C)$
 $= (0.2) \cdot (0.02) + (0.45) \cdot (0.01) + (0.35) \cdot (0.03)$
 $= 0.019$

Navigation: previous, next, in depth contents, glossary, credits, print, exit

Animals: cow, pig, chicken, horse



Innovative eLearning system for the agricultural sector in the Mediterranean countries: detection, diagnosis, control and prevention of Arthropod-borne diseases



- Blue tongue
- Rift Valley Fever
- West Nile Disease
- Equine Encephalomyelitis
- African Horse Sickness





Validation of an eLearning system able to respond to the urgent needs of veterinary professionals of learning quickly on emerging and re-emerging animal diseases and zoonoses.

- Adaptability and effectiveness to satisfy the urgent need to transfer knowledge, skills and competences to face the emergency situation.



eMed: an exportable model



Transferable, sustainable and repeatable learning model, whose main components are:

- analysis of data emerging from information systems, risk analysis studies, disease surveillance and control programmes at global level;
- monitoring of learning needs at global level;
- definition of technical contents consistent with the skills that are to be improved;
- learning guided by adequately skilled tutors and specifically designed materials;
- monitoring process in place.



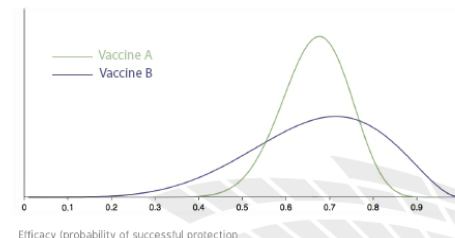
eLearning modules in veterinary epidemiology and risk analysis

- Principles of epidemiology
- Epidemiological surveillance in Veterinary Public Health
- Risk analysis I
- Risk analysis II
- Geographic Information Systems
- Risk communication

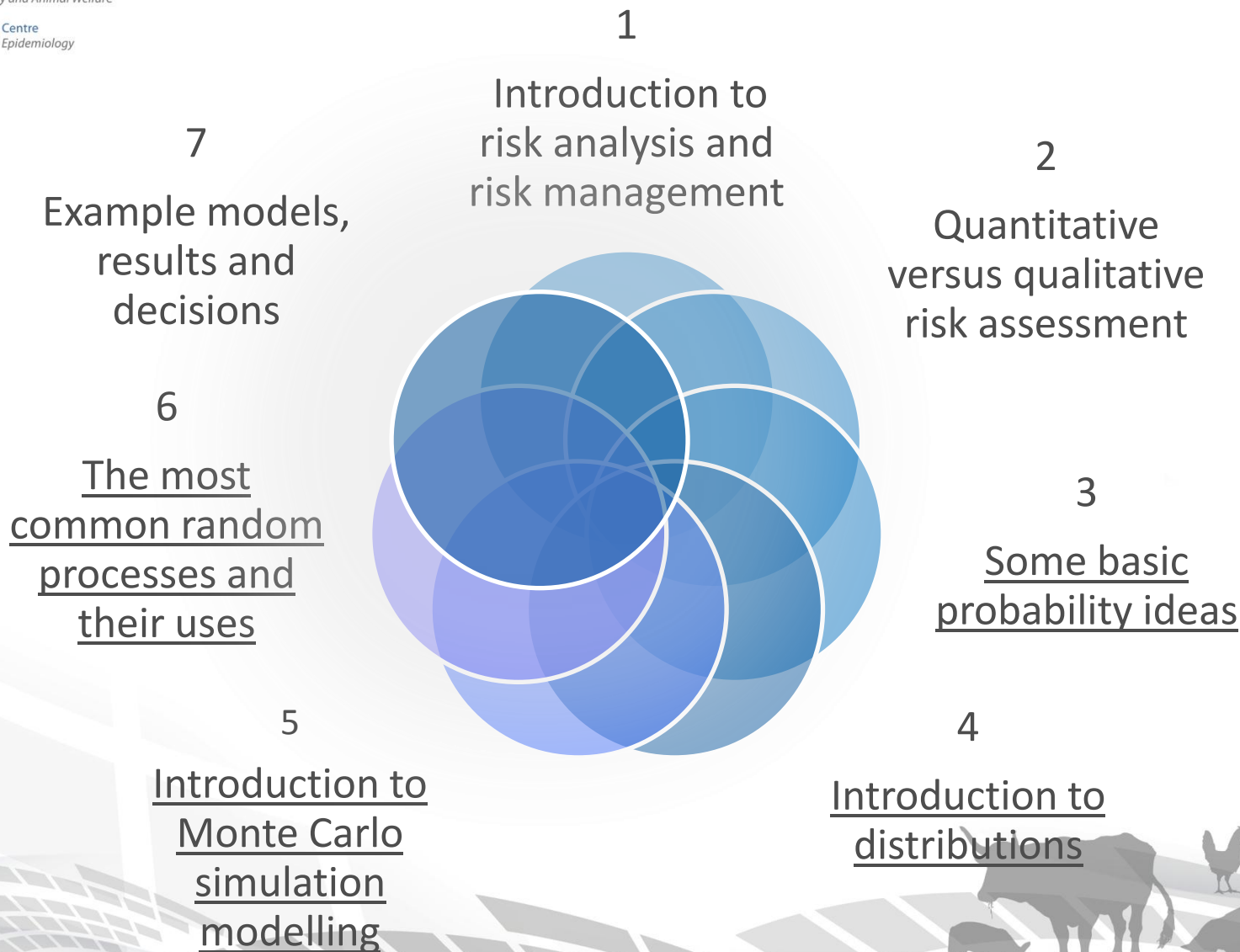
Introduction to risk analysis and risk management // What is food safety risk assessment?

In business and government one faces having to make decisions all the time where the outcome is uncertain. **Understanding the uncertainty** can help us make a much better decision.

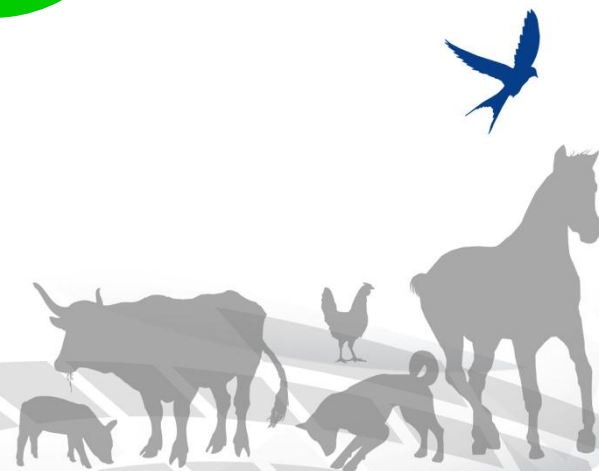
Imagine that you are a national healthcare provider considering which of two vaccines to purchase. The two vaccines have the same reported level of efficacy (67%), but further study reveals that there is a difference in confidence attached to these two performance measures: one is twice as uncertain as the other.



The *tree* of the basic module



The *tree* of the advanced module





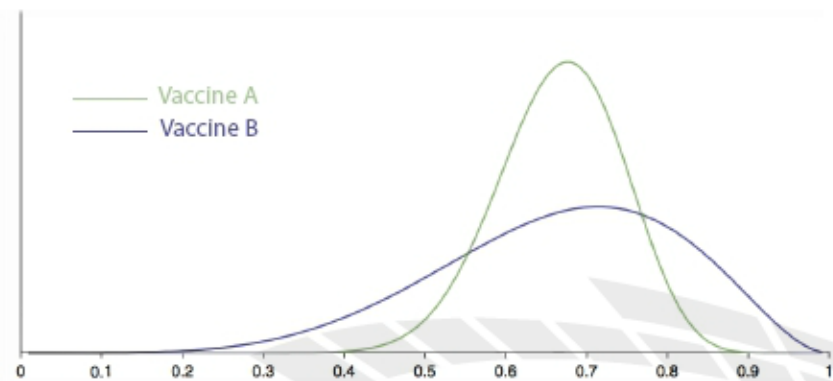
Introduction to risk analysis and risk management

// What is food safety risk assessment?

Efficacy comparison for two vaccines: the vertical axis represents how confident we are about the true level of efficacy. The scale was omitted to avoid some confusion at this stage.

In business and government one faces having to make decisions all the time where the outcome is uncertain. **Understanding the uncertainty** can help us make a much better decision.

Imagine that you are a national healthcare provider considering which of two vaccines to purchase. The two vaccines have the same reported level of efficacy (67%), but further study reveals that there is a difference in confidence attached to these two performance measures: one is twice as uncertain as the other.



Efficacy (probability of successful protection)



Introduction to risk analysis and risk management

// What is food safety risk assessment?

We can distinguish between **two types of event**:

// A **risk** is a random event that may possibly occur and, if it did occur, would have a negative impact on the goals of the organisation. Thus, a risk is composed of three elements: the scenario; its probability of occurrence; and the size of its impact if it did occur (either a fixed value or a distribution).

// An **opportunity** is also a random event that may possibly occur but, if it did occur, would have a positive impact on the goals of the organisation. Thus, an opportunity is composed of the same three elements as the risk.



A risk and an opportunity can be considered the opposite sides of the same coin. It is usually easiest to consider a potential event to be a risk if it would have a negative impact and its probability is less than 50%, and, if the risk has a probability in excess of 50%, to include it in a base plan and then consider the opportunity of it not occurring.

veterinary epidemiology // Basic course on Veterinary Epidemiology

Introduction to risk analysis and risk management

// Designing a risk assessment

// Figure out the real problem with managers

The purpose of a risk analysis is to provide information to help make better decisions in an uncertain world. A decision-maker has to work with the risk analyst precisely to define the questions that need answering.

First we need to decide whether a model is needed or a simple data analysis can suffice. When a model is needed, often a single model cannot answer all questions, or has to be built in a complicated way to answer several questions.

If we rank the questions that need answering from "critical" down to "interesting", a common recognition of the extra effort needed to answer each question going down the list can help determining a cut-off point.



Introduction to risk analysis and risk management

// Designing a risk assessment



// Find the quantitative information that managers and target audience will be able to use

Discuss with the risk manager the form of the answer.

For example, if you want to know how many cases of listeriosis you expect from the consumption of smoked salmon, you need to specify if you want the number of cases per million servings or per million people (which requires the knowledge of the consumption of smoked salmon). You need to specify whether you want just the mean (which can make the modelling a lot easier) or a graph of the distribution. Explain what **statistics you need and to what accuracy**, as this will help the risk analyst save time or figure out that an unusual approach might be needed to get the required accuracy.



Introduction to risk analysis and risk management

// Designing a risk assessment

// Decide the complexity of the risk assessment.

Designing a risk assessment should be pragmatic:

- // Focused on answering the most important questions
- // Based on available data
- // Adheres to constraints
- // Achievable within a budget, timeframe
- // Understandable, adaptable, auditable

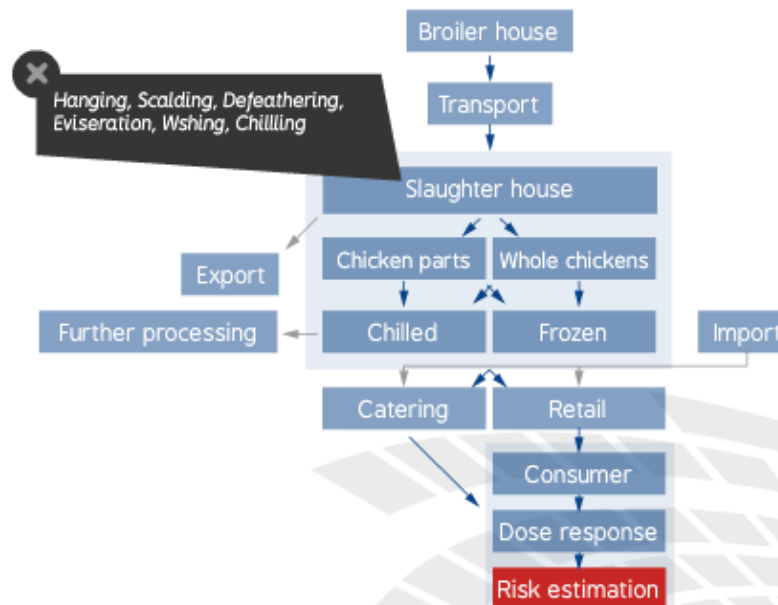


Introduction to risk analysis and risk management

// Designing a risk assessment

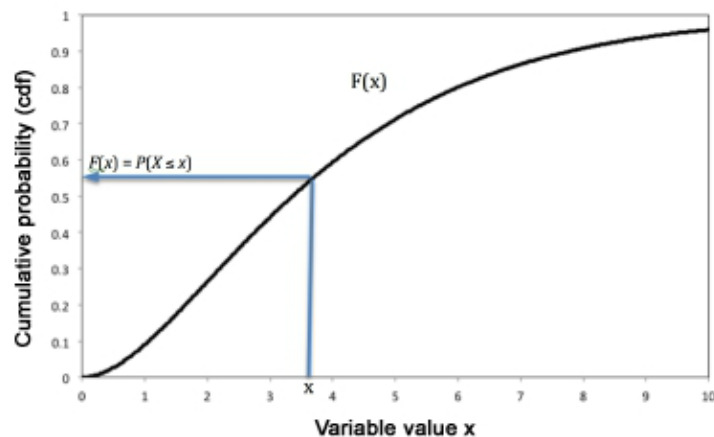
Example of Farm-to-Fork model *Campylobacter* in poultry

From: Draft report 2001
Institute of Food Safety and Toxicology
Division of Microbiological Safety
Danish Veterinary and Food Administration



Some basic probability ideas

// Probability distribution equations



This Cumulative Distribution Function is for a continuous variable

// Cumulative Distribution Function (cdf)

The (cumulative) distribution function, or *probability distribution function*, $F(x)$ is the mathematical equation that describes the probability that a variable x is less than or equal to x , i.e.

$$F(x) = P(X \leq x)$$

for all x where $P(X \leq x)$ means the probability of the event $X \leq x$.

Some basic probability ideas

// Probability distribution equations

// Cumulative Distribution Function (cdf)

If a random variable x is discrete, i.e. it may take any of a specific set of n values, then the cumulative distribution function has the shape of a flight of stairs:

Cumulative Distribution Function

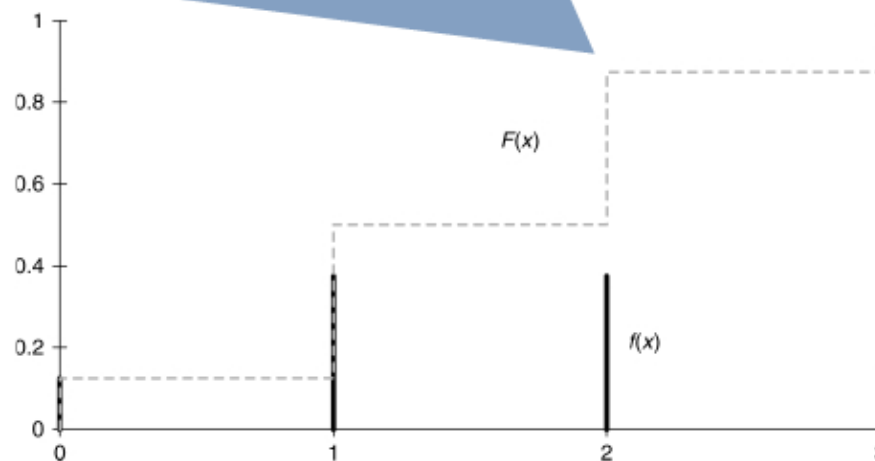


Figure title: Distribution of the possible number of heads in three tosses of a coin.

Some basic probability ideas

// Probability distribution equations

// Cumulative Distribution Function (cdf)

A cumulative distribution function has the following properties:



1

$F(x)$ is always non-decreasing, i.e.

$$\frac{d}{dx} F(x) \geq 0$$



2

$$F(x) = 0 \text{ at } x = -\infty$$

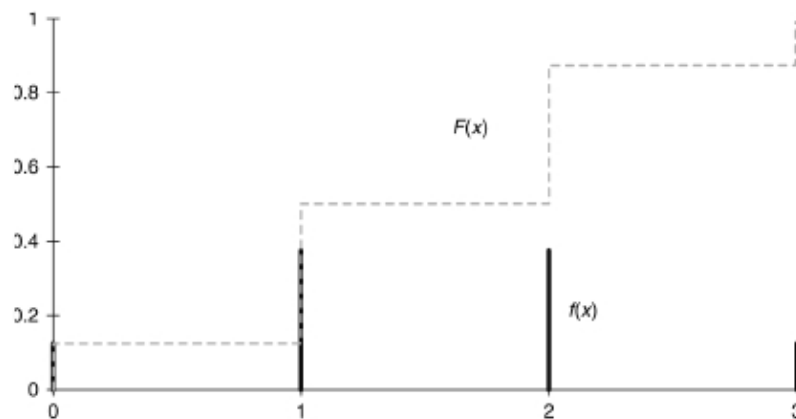
$$F(x) = 1 \text{ at } x = \infty$$



Some basic probability ideas

// Probability distribution equations

// Probability Mass Function (pmf)



Cumulative Distribution Function

If a random variable X is discrete, i.e. it may take any of a specific set of n values x_i , $i = 1$ to n , then:

$$P(X = x_i) = p(x_i)$$

Probability Mass Function (pmf)

Figure title: Distribution of the possible number of heads in three tosses of a coin.

Some basic probability ideas

// Probability distribution equations

// Probability Density Function (pdf) : Example

Consider a continuous variable that takes a Rayleigh(1) distribution. Its cumulative distribution function is given by

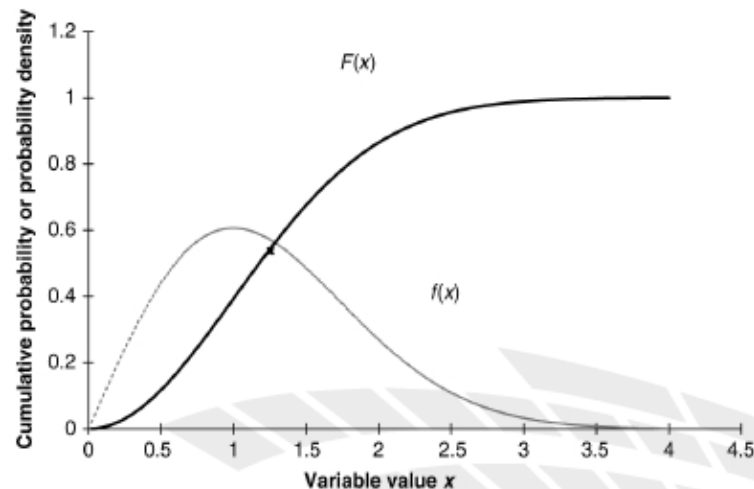
$$\begin{aligned} \rightarrow F(x) &= 0 & x < 0 \\ F(x) &= 1 - e^{-x^2/2} & x > 0 \end{aligned}$$

and its probability density function is given by

$$\begin{aligned} \rightarrow f(x) &= 0 & x < 0 \\ f(x) &= xe^{-x^2/2} & x > 0 \end{aligned}$$

The probability that the variable will be between 1 and 2 is given by

$$\begin{aligned} \rightarrow p(1 < x < 2) &= F(2) - F(1) \\ &= (1 - e^{-2}) - (1 - e^{-0.5}) \approx 47.12\% \end{aligned}$$



F(x) and f(x) for this example are shown in the figure.

Some basic probability ideas

// Probability distribution equations

// Bayes Theorem: Examples

1

Example 1. The following example illustrates the use of this equation. More are given in the advanced risk analysis module.

Three farms A, B and C produce 20%, 45% and 35% respectively of the eggs consumed in a town. 2%, 1% and 3% respectively of these eggs are contaminated with some Salmonella.

Some basic probability ideas

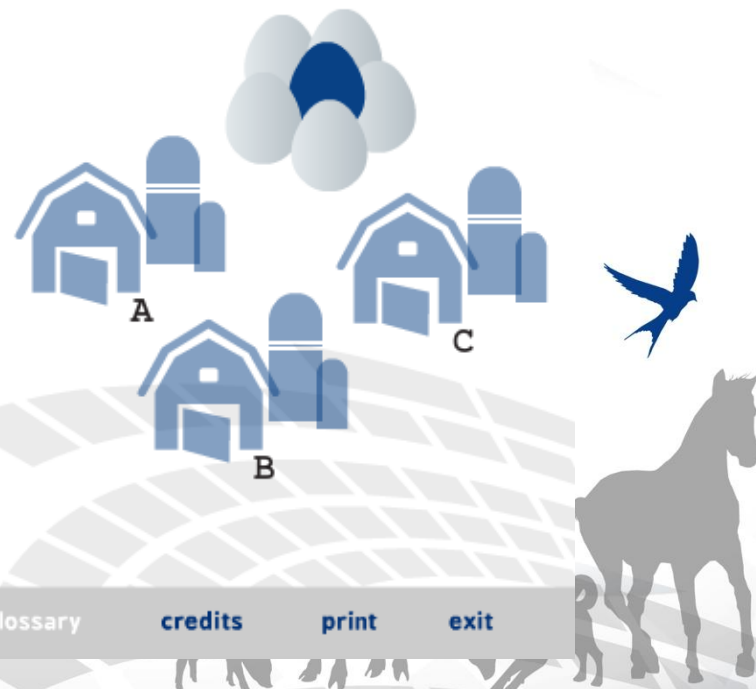
// Probability distribution equations

// Bayes Theorem: Examples

1

A. What is the probability that any randomly selected egg on sale in the town will be contaminated? Let x be the event that the egg is defective and A , B , and C be the events that the selected egg came from farms A , B and C respectively. Using simple chain rule probability mathematics:

$$\begin{aligned} P(X) &= P(A) \cdot P(X|A) + P(B) \cdot P(X|B) + P(C) \cdot P(X|C) \\ &= (0.2) \cdot (0.02) + (0.45) \cdot (0.01) + (0.35) \cdot (0.03) \\ &= 0.019 \end{aligned}$$



Some basic probability ideas

// Probability distribution equations

// **Question 2:** Which of the following describes a diagnostic test's sensitivity?

- ☐ The probability that at least one infected animal will test positive
- ☐ The fraction of tested animals that are infected
- ☒ The probability that a randomly selected animal will test positive // **try again**
- ☐ The probability that a sick animal in a population will test positive
- ☐ The probability that a randomly selected and infected animal in a population will test positive

Check answers



Some basic probability ideas

// Probability distribution equations

// **Question 2:** Which of the following describes a diagnostic test's sensitivity?

- ☐ The probability that at least one infected animal will test positive
- ☐ The fraction of tested animals that are infected
- ☐ The probability that a randomly selected animal will test positive
- ☐ The probability that a sick animal in a population will test positive
- ☒ The probability that a randomly selected and infected animal in a population will test positive // **correct**

[Check answers](#)



Share, share, share

- 
- We don't want to keep all this for our own
 - We want to share
 - We want to improve
 - We want to make it available in many languages
 - We want this to achieve the highest possible target
 - ... AAA desperating seeking volunteers!



Where are we going to?

- 
- Possibility to include more laboratories
 - Implement synergies among Twinnings and other capacity building initiatives
 - Find complimentary funds



We want to work with those countries that:

- Believe in the possibility to develop a sustainable integrated system for animal health and welfare, food safety, environment protection;
- Consider the regional approach to TADs as the only winning strategy
- Fight against zoonoses considering this as a challenge with a single matrix
- Believe that one health is the only possible choice





Oie Collaborating Centre
for Veterinary Training, Epidemiology,
Food Safety and Animal Welfare

FAO Reference Centre
Veterinary Epidemiology



Merci pour votre attention

