



Better Training for Safer Food BTFSF

Biosecurity measures as laid down in
Chapter II of EU Directive 2006/88

L 7

Biosecurity and the control of Notifiable Diseases of fish under EU legislation

Control fish disease introduction and spread

Application of effective biosecurity measures



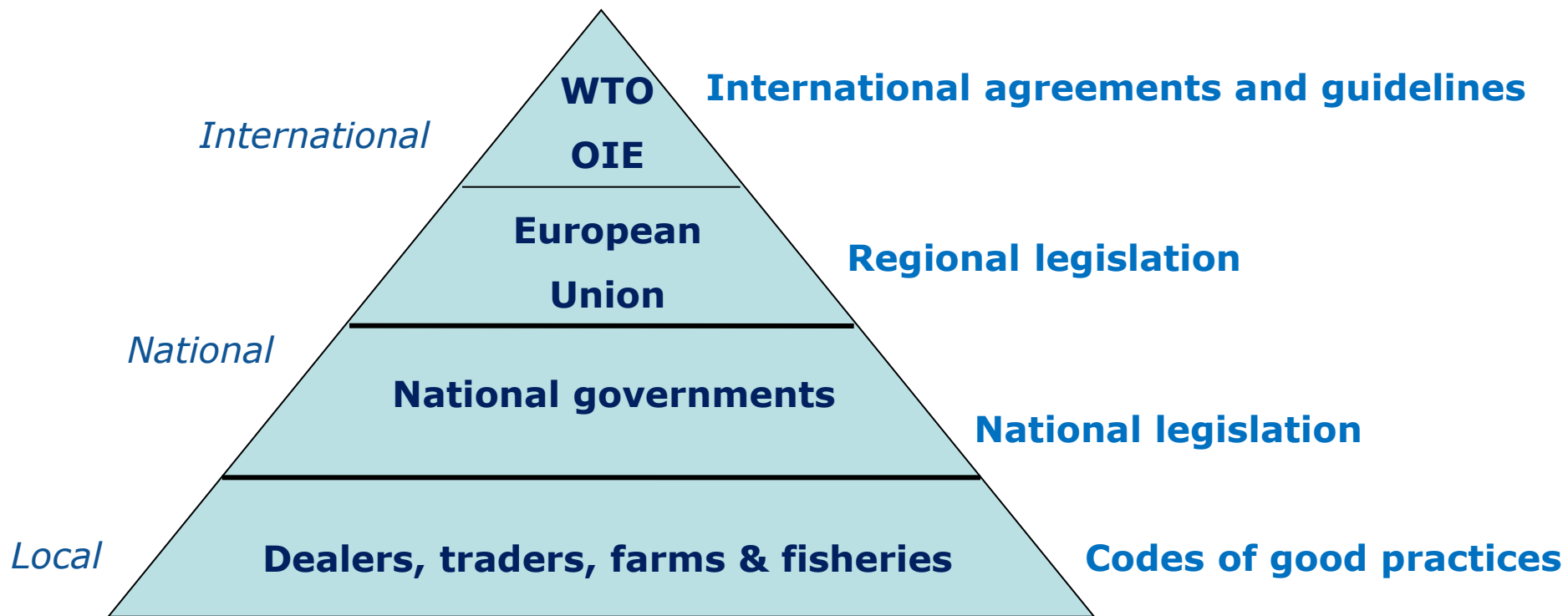
WORLD TRADE
ORGANIZATION



Monitoring status of diseases internationally and sets guidelines (world standards)

- **EU through its legislation Common rules and standards**
- **EU Member States implement them under direction of national competent authorities**
- **Aquaculture Production Businesses (APBs) owners are responsible for biosecurity**

Biosecurity: Introduction



Biosecurity: Introduction

Key elements of biosecurity:

- Adequate diagnostic and detection methods for infectious diseases
- Disinfection and pathogen eradication methods
- Reliable high quality sources of stock
- Optimal management practices

At the **local level**, implementation of an effective biosecurity measures plan is essential in reducing the risk of disease introduction to a APB or any fish holding

Prevention is better than a cure
It is widely accepted that fish disease prevention is cheaper than the cure

Biosecurity: Responsibility at the APB level

- **Good biosecurity management:**
 - Effective implementation of plan
 - Regular updating and the of good record keeping
 - Active collaboration among Veterinarians and specialists in fish health

- **Effective measures at the APB level against disease outbreaks** should ensure:
 - Threat of spread is kept to a minimum
 - Track and control outbreak effectively and in a timely manner

Biosecurity: Staff training in fish health management and disease recognition (I)

Need to assess the specific disease risks to the APB fish stocks and parameters that could precipitate clinical outbreaks. **This should result in a timely response to any outbreak.**

Staff training and periodic refresher courses provide better disease recognition in fish stocks informed and trained staff will be of greater benefit to the business.

All staff in a APB should play an active part in the biosecurity measures plan and in reassessment of it at the practical level.

Biosecurity: Staff training in fish health management and disease recognition (II)

Further information and advice available from a variety of sources:

- Textbooks, Periodicals (Finfish News, Fish Farmer, Fish Farming International, etc), Disease recognition leaflets and posters..
- Internet
 - <http://www.oie.int/en/international-standard-setting/aquatic-code/>
 - <http://www.cefas.defra.gov.uk/idaad/>
 - <http://www.defra.gov.uk/aahm/>
- Veterinarians and fish health professionals
- Conferences, meetings and trade organisations

Lessons learnt from disease outbreaks (I)

- Experience from previous disease outbreaks with fish and other animals indicates that **unexpected incidents and situations are often the cause of disease outbreaks** or spread
- Those responsible for the care of fish in farms, fisheries or other waters need to be vigilant in order to reduce the disease risk to the minimum and maintain biosecurity. These risks can arise from unexpected sources and brainstorming sessions during biosecurity planning, in part is designed to **identify the risks and reduce them to the minimum**
- For example during the **2006 VHS outbreak in UK**, CEFAS expected the disease to spread or at least persist in wild salmonids in the river below the affected farm. However further studies showed that the wild stocks of susceptible fish (brown trout and grayling) were in fact quite resistant to infection and soon tested negative for the disease, even when subsequently held under stressful conditions experimentally.

Lessons learnt from disease outbreaks (II)

- Analysis of all the risks examined and the evidence gathered led to **two sources** being the most likely cause of 2006 VHS outbreak in UK :
 - Processing of fish from VHS unapproved zones in Europe at a fish processing establishment.
 - Transfer of infection with contaminated containers that had previously held dead fish from VHS unapproved zones in Europe for processing
- Ultimately neither source could be definitely confirmed as the source but **trade in fish for food** and related commodities do appear to **pose risks which often go unrecognised**

Lessons learnt from disease outbreaks (III)

- Sources of outbreaks of KHV and SVC in fishery stocks are also difficult to identify, not least because of the open public access to UK waters through footpaths and for water sport activities. However findings from epidemiological investigations suggest that the inappropriate mixing of **coldwater ornamentals** such as goldfish and koi varieties with fish destined for restocking open waters poses a significant risk
- Council Directive 2006/88 is designed to address the risks through the requirement for ongoing biosecurity planning for APBs and APEs

Biosecurity: Identifying the risks of introducing and spreading disease through fish movement (I)

Probably the greatest risk of introducing an infectious agent into an APB comes with **movements of fish**.

Where fish and/or eggs are introduced from outside sources the following should be considered:

- Check the **suppliers biosecurity measures plan** (you may wish to review certain aspects of their plan with your veterinary professional to assess any inherent risks). Decision 2008/392 also provides for web based information on EU APB,s including health status, species held etc to be available to assess risk of spread.
- Do not hesitate to ask for **details of fish health surveillance programmes and disease records**. Be sure you are aware of the provenance any fish when buying from a supplier.
- The stock should **not be exhibiting any clinical signs of disease** at the time of transportation

Biosecurity: Identifying the risks of introducing and spreading disease through fish movement (II)

- Attention should be paid to both **transport, water sources** and disinfection procedures applied to the **equipment** used
- **Eggs should be disinfected** prior to introduction to the hatchery and any packaging disposed of carefully
- If **possible isolate** newly introduced fish from other stocks until their health status can be established/confirmed
- Consider the risks associated with **movements of dead fish or fish products and waste** for processing both for introduction into the APB and associated with their removal from the APB
- Consider the risk posed by **wild fish** and those that may be introduced into source adjacent waters that act as fisheries

Biosecurity: Identifying the risks of introducing and spreading disease as a result of site procedures

Other routes by which infectious agents can be introduced and spread within an APB , and a biosecurity measures plan should cover these risks considering some areas:

- Use of shared equipment and vehicles
- Visitor access to the site , including delivery drivers, other APB operators, Veterinarians and fish health professionals, inspection agencies, etc
- Spread of disease by vermin, birds and other predators
- The potential for water to transfer disease to or from the APB
- management of extreme weather conditions – floods and tides
- The presence of a fishery on site or near by
- Access to the site by staff from other APB's
- Other activities in the water catchment (e.g. fish processing)

Biosecurity: Risk mitigation

Once a comprehensive list of fish health risks for an APB have been identified the APB biosecurity manager needs to decide on **appropriate systems and procedures to control or reduce these risks**. Such measures may include:

- Early identification of disease through regular stock inspections
- Ensuring staff are trained to recognise the clinical signs of disease and to identify procedures that carry a risk of introducing or spreading disease
- Ensuring the fish husbandry on the APB is suitable for the species held
- Limit APB access to authorised staff or approved visitors
- Provide advice on biosecurity for fish farm visitors and anglers at fisheries

Biosecurity: Risk limitation

Options for risk limitation include:

- Identify and set up zones within APB's, e.g. hatchery, fishery lake, packing and processing, parking, storage. Restrict access to zones
- Provide zone-specific protective clothing. Consider using colour-coded boots/overalls for particular zones
- The use of suitable disinfectants and disinfection procedures for personal protective gear and other equipment
- Introduce disinfection protocols for site visitors (including delivery vehicles)
- It is the biosecurity manager's responsibility to ensure these measures are implemented and monitored for compliance

Biosecurity: Monitoring the biosecurity measurement plan

Maintenance of a **clear recording system** for the results of the checks under the biosecurity measures plan and actions taken. A comprehensive log or diary can be used to demonstrate to interested parties (customers, senior management, auditors, quality management and inspection agencies) that an effective biosecurity measures plan is in operation. An **information log might include:**

- Stock health assessments
- Routine inspection of stock is an essential activity on a fish farm or fish holding unit
- An inspection should record numbers of sick and dead fish in holding units, other health related observations such as feeding response and water quality parameters
- Establish a formal chain of reporting to ensure the biosecurity manager is quickly informed of any potential problems

Biosecurity: Monitoring the biosecurity measurement plan

Visitor log: Keep a record of all visitors to the APB ensuring visitors are aware of the biosecurity measures that apply to them

Disinfection procedures: Record dates of disinfectant solution replacement. Disinfectant solutions need to be replaced before they lose efficacy

Further useful **biosecurity information** needs to be recorded in other formats:

- Movements on and off site, a condition of authorisation
- Maintaining treatment records are a requirement under the Veterinary Medicine Regulations 2008
- CA provide books for these records, or it may be recorded electronically
- Movements within the site : detailed records of how fish batches have been mixed. May be useful in zoned APB and for tracing
- Details of significant weather conditions, e.g. electrical storms or flooding

Biosecurity: Contingency planning

In developing an effective biosecurity measures plan for each risk identified there needs to be **appropriate remedial or countermeasure developed**. All staff should be made aware of appropriate remedial action plans.

The **protocol** should cover identification of problems:

- Through **routine stock monitoring and accurate records** should enable early recognition of problems offering an opportunity for early remedial action.
- Due to a recognisable disease or parasite. For certain non-notifiable diseases recognised treatment and **vaccination programmes** are available, but guidance should be sought in advance. The biosecurity measures plan should include the treatment, vaccination (as appropriate) and action to be taken to counteract diseases, discussion with a fish health professional essential. A Veterinarian will be involved if veterinary medicines are used.



Biosecurity plan

A well thought through **biosecurity plan** implemented and 'owned' by committed staff can limit risks of spread to and from a APB and therefore affect its risk level and the surveillance necessary. Which may act as a further incentive

The plan should be in conjunction with plans at the **compartment, zone and territory levels** in order to ensure optimum benefits and may form a partnerships and agreements between factions of industry and also potentially with official services



Biosecurity: Legislation

Council Directive 2006/88/EC of 24
October 2006 on animal health requirements
for aquaculture animals and products
thereof, and on the prevention and control
of certain diseases in aquatic animals



Directive 2006/88

Under EU Directive 2006/88, National authorities should grant Aquaculture Business authorisation to Fish business or processing establishment which fulfils the **conditions** laid down in:

Article 5. Authorisation of aquaculture production businesses and processing establishments

Article 8. Recording obligations – Traceability

- All movement of aquaculture animals and products
- Mortality in each epidemiological unit
- Results of the risk-based animal health surveillance programme
- Transport documentation: mortality, destinations and water exchange

Article 9. Good hygiene practices

Article 10. Animal health surveillance scheme



Directive 2006/88: Article 5

Authorisation of aquaculture production businesses and processing establishments

Minimum information required in an application for APB authorisation include:

1. Identification of the site
2. Geographical position
3. General description of facilities
4. Registration of fish movements (in and out)
5. Updated health status
6. Health Management Practices applied
7. Risk assessment grid



Directive 2006/88: Annex II.B

1. Identification of the site

- (a) the **name and addresses** of the aquaculture production business, and contact details (telephone, facsimile, e-mail)

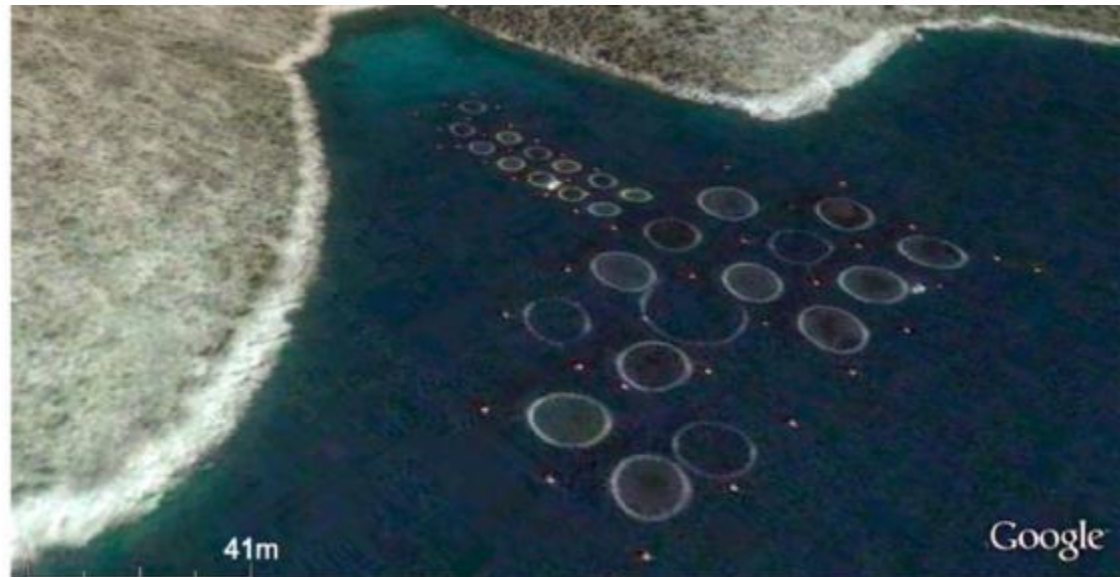
- (b) the **registration number** and particulars **of the authorisation delivered** (i.e. dates for specific authorisations, identification codes or numbers, specified conditions for production, any other matter relevant to the authorisation)

Directive 2006/88: Annex II.B

2. Geographical position

- (c) the geographical position of the farm defined by a **suitable system of coordinates** of all farm-sites (if possible, GIS coordinates)

**Fish farm off the coast of Greece
(38619923.830N
24602938.580E).**



Trujillo P, Piroddi C, Jacquet J (2012) Fish Farms at Sea: The Ground Truth from Google Earth. PLoS ONE 7(2): e30546. doi:10.1371/journal.pone.0030546

Directive 2006/88: Annex II.B

3. General description of facilities

- (d) the **purpose, type** (i.e. type of culture system, or facilities such as land based facilities, sea cages, earth ponds) and **maximum volume of production** where this is regulated;
- Health segmentation of the site
 - Quarantine area
 - Processing facilities on site
 - Measures in place to avoid the propagation of listed disease
- (e) for **continental farms**, dispatch centres and purification centres, details on the farm's **water supply and discharges**;
- Water supply – circulation of water on the site

Directive 2006/88: Article 8

4. Registration of fish movements (in and out)

Keep a record of: (a) **all movements** of aquaculture animals and products thereof into and out of farm or mollusc farming area

■ **Origin of Aquatic animals or their products**

- Provide the list of suppliers

■ **Destination of the aquatic animals or their products**

- Human consumption (angling or processing on site – processing on another site)
- Restocking in the same compartment or another compartment
- Fish farm in the same compartment or another compartment

■ **Registration of fish movements (in and out)**

- Registration of all correspondant information



Directive 2006/88: Annex II

5. Updated health status

- (f) the **species of aquaculture animals reared** at the farm (for multi-species farms or ornamental farms, it shall as a minimum be registered whether any of the species are known to be **susceptible to diseases** listed in Part II of Annex IV, or known vectors of such diseases);
- (g) updated information on the **health status** (i.e. if the farm is disease-free (located in a Member State, zone or compartment), where the farm is under a programme with a view of achieving such status, or where the farm is declared infected by a disease referred to in Annex IV).



Directive 2006/88: Article 9

6. Health Management Practices applied

Member States shall ensure that APBs and authorised processing establishments implement good hygiene practices, as relevant for the activity concerned, to prevent the introduction and spreading of diseases.

Affiliation to a:

- **GDS Groupement de Défense Sanitaire**
- ADS: Asociación de Defensa Sanitaria

Directive 2006/88

The French approach: GDS (Groupement de Défense Sanitaire)

Redaction by the Professional (French Federation of Producers) of a **Handbook of Good Health Management Practices for Aquaculture sites (GBPSA)**

Handbook validated by DGAL / AFSSA (Central administration) – under process

Fish Health Inspectors check the implementation of Health Management Practices during their site inspection



Directive 2006/88

The French approach: GDS (Groupement de Défense Sanitaire)

Handbook of Good Health Management Practices for Aquaculture sites (GBPSA)



- Description of legislation related to APBs
- Identification, management and control of health risks
- Health management practices
- Description of the main pathologies present in France, in fresh water and marine aquaculture



Directive 2006/88

The French approach: GDS (Groupement de Défense Sanitaire)

Health management practices (I)

■ **Water supply**

Origin of the water, risk of water contamination, treatment of incoming water, water circulation on site, outlet water treatment

■ **Control of movement of persons and vehicles**

Fencing of the site, physical separation of the different epidemiologic segments, traceability of visitors movement presenting a risk

■ **Control of pests**

Predator nets, eradication plan for pests, access of the site to other animals

Directive 2006/88

The French approach: GDS (Groupement de Défense Sanitaire)

Health management practices (II)

■ Disinfection procedures

- Disinfection of vehicle on entrance, footbath and handwash between each segments
- Disinfection procedure for small material
- Cleaning and disinfection procedure of facilities – dry out periods
- Eggs disinfection

■ Control of Mortalities

- Regular collect of dead and moribund fish – registration of mortality for each epidemiological sector
- Storage of dead fish – Destruction of dead fish

Directive 2006/88

The French approach: **GDS** (Groupement de Défense Sanitaire)

Health management practices (III)

- **Storage of chemicals and condition of manipulation**
- **Information of workers on hygiene and health management practices**
- **Control of the registration of data in the farm book**
Mortality in each epidemiological unit, treatments, movements, results of surveillance programme in place following the risk assessment, transport documents) for **traceability**

These aspects are developed in the GBPSA. Fish health Inspectors and fish veterinarians will check their application during their visits on site

Directive 2006/88

The French approach: GDS (Groupement de Défense Sanitaire)

Affiliation to a GDS: Groupement de Défense Sanitaire

Associative structure of producers and retailers covering one region allowing:

- To set up a common health management in the region
- To be a privileged interlocutor with the administration and financial bodies (can subsidised viral analysis for their adherents)
- To set up common prophylactic actions (vaccination)

Groupement de Défense Sanitaire Aquacole d'Aquitaine
CARTE D'IDENTITE SANITAIRE PISCICOLE N° 40.222.028
PISCICULTURE DU MOULIN - LE MOULIN
ADHESION AU GDSAA LE 01/04/1986
EN COURS D'OBTENTION D'ACREMENT SANITAIRE EUROPEEN SHV/NH1
N° D'ENREGISTREMENT DE LA DIRECTION DES SERVICES VETERAIRES : 40048002

Destinataires espèces analysées: **Truite Arlandaise**
 Truite de Fontaine
 Truite Fario

Adresse du responsable: **Mr DURANT**
 Pisciculteur du Moulin
 89009 CAYENNE

Agents pathogènes		1 ^{er} et 2 ^{es} trimestres 2003	3 ^{er} trimestre 2003	4 ^{ème} trimestre 2003	1 ^{er} trimestre 2004	De 01/01/2004 au 30/09/2004
Virus de la MHV - MHV (Mycobacterium fortuitum, Yersinia)	Truite de la MHV - MHV	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
	Truite de la MHV - MHV	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
Virus de la IPN (Ictérius Necroticans Infectiosus)	Truite de la IPN	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
	Truite de la IPN	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
Bactéries salmonelles (groupe B, S, Typhimurium)	Truite de la Salmonelle	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
	Truite de la Salmonelle	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
Virus de la IPN (Ictérius Necroticans Infectiosus)	Truite de la IPN	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
	Truite de la IPN	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
Virus de la IPN (Ictérius Necroticans Infectiosus)	Truite de la IPN	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
	Truite de la IPN	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
Virus de la IPN (Ictérius Necroticans Infectiosus)	Truite de la IPN	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché
	Truite de la IPN	Non recherché	Non recherché	Non recherché	Non recherché	Non recherché

DIRECTION ASSOCIATIVE DU 1505104 au 1505104

Légende:
 * MRC : Maladies Respiratoires Compensées à déclaration obligatoire.
 * La mention « non recherché » signifie que le GDSAA n'a pas fait d'analyse sur le site pour cette période.
 * La mention « absence de » signifie qu'à la date indiquée, correspondant à la dernière analyse du GDSAA de la période, l'agent pathogène correspondant n'a pas été mis en évidence.
 * La mention « GDSAA » signifie que la présence de l'agent pathogène a été soupçonnée ou confirmée par les techniques utilisées. Pour plus d'informations sur un résultat, contactez votre Fédération.

Arrêté ministériel n° 1285 du 14/04/2004
 * La présence de l'agent pathogène à analyser est obligatoirement la présence de la maladie.
 * Les résultats des analyses ne sont en aucun cas transmis par le GDSAA, soumis à confidentialité. Pour toute information relative votre Fédération. Le GDSAA décline toute responsabilité concernant les informations transmises par le Fédération et l'usage qu'il fait de la Carte d'Identité Sanitaire.

Fait à Mont de Marsan, le : 06/06/05
 Le directeur vétérinaire du GDSAA.

(Signature et tampon GDSAA)

Decision 2008/896

7. Risk assessment grid

- A risk assessment grid has been defined and has to be applied by producers to define the level of risk encountered on its site
- This grid will be checked by the Official Health Inspectors during the visit on site done following the application for a APB authorisation
- From the level of risk identified will depend the surveillance programme implemented for the site (Directive 2006/88/CE, Annex III – part B)

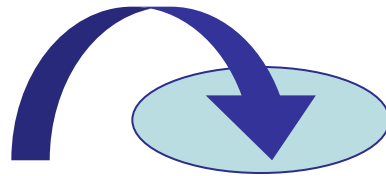
Commission Decision 2008/896/EC of 20 November 2008 on guidelines for the purpose of the risk-based animal health surveillance schemes provided for in Council Directive 2006/88/EC

Decision 2008/896

7. Risk assessment grid

Step I: Approximation of the likelihood of the **contraction** of disease on the farm or in the mollusc farming area

Likelihood of the contraction of disease **via water** and due to the **geographical proximity** of farms and mollusc farming areas



Likelihood of the contraction of disease through **movements** of aquaculture animals

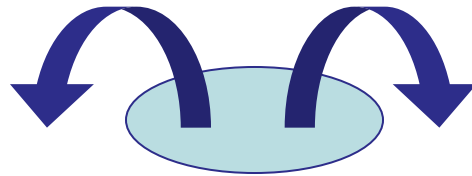
	High	Low
High	High	Yellow
Low	Yellow	Low

Decision 2008/896

7. Risk assessment grid

Step II: Approximation of the likelihood of the **spread** of disease from the farm or mollusc farming area

Likelihood of the spread of disease **via water** and due to the **geographical proximity** of farms and mollusc farming areas



Likelihood of the spread of disease through **movements** of aquaculture animals

	High	Low
High		
Low		

Decision 2008/896

7. Risk assessment grid

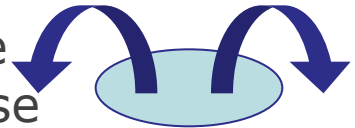
Step III: Combining the estimates of risk levels resulting from steps I and II



Step I.
Likelihood of the
contraction of
disease

High	Yellow	Red	Red
Medium	Green	Yellow	Red
Low	Green	Green	Yellow
	Low	Medium	High

Step II. Likelihood of the
spread of disease

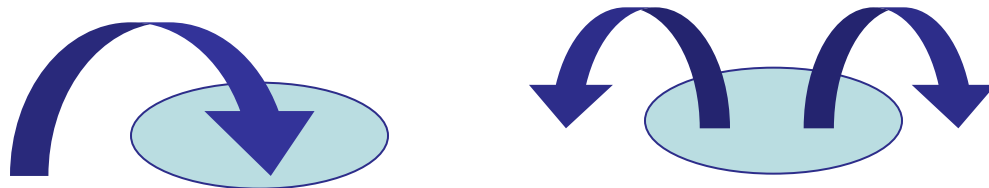


Decision 2008/896

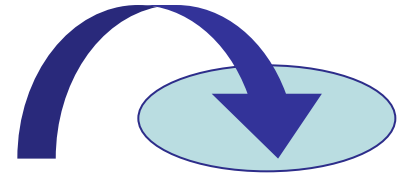
7. Risk assessment grid

Elements to take into account for **contraction** or **spread**:

- Via water
- Geographical proximity to other APB
- Movements of animals

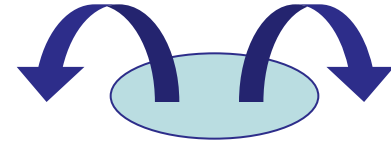


Decision 2008/896



7. Risk assessment grid (low risk situations)

- **Water discharge/Geographical proximity** (contraction)
 - Borehole or spring
 - Water disinfected or treated in order to prevent introduction of pathogens
 - Water supply not connected to APBs
 - Absence of wild aquatic animals of susceptible species
 - From inland water basins isolated from other water sources (consider flooding due to seasonal changes)
 - From coastal farms and mollusc farming areas protected by a safe distance from other APBs (ability of relevant pathogens to survive in open waters, water currents and length of tidal excursions)



Decision 2008/896

7. Risk assessment grid (low risk situations)

■ Water discharge/Geographical proximity (spread)

- No discharge into natural waterways
- Disinfect or treat water discharge to prevent spread of pathogens
- Into public sewage systems with any treatment for sewage water
- No discharge into waters with aquaculture or wild aquatic animals of species susceptible to relevant listed disease(s)
- Into inland water basins isolated from other water sources (consider flooding due to seasonal changes)
- Into coastal farms and mollusc farming areas protected by a safe distance from other APB (ability of relevant pathogens to survive in open waters, water currents and length of tidal excursions)

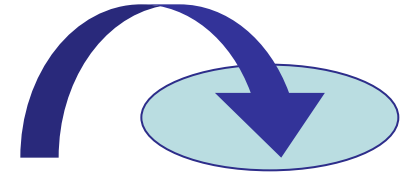
Decision 2008/896

7. Risk assessment grid (low risk situations)

■ **Movements of animal:** Factors to take into account:

- Place of origin of the aquaculture animals
- Number of aquaculture animals supplied to the farm or mollusc farming area
- Number of different suppliers of aquaculture animals
- Frequency of movements of aquaculture animals into and out of farms and mollusc farming areas

Decision 2008/896

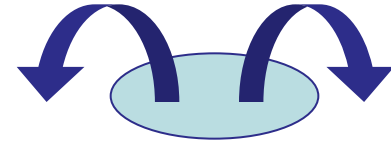


7. Risk assessment grid (low risk situations)

■ **Movements of animals** (contraction)

- APBs which are self sufficient with eggs or juveniles
- Aquaculture animals supplied only from disease-free zones
- Supply of wild aquatic animals, released from quarantine and intended for further farming
- Supply of disinfected eggs (only if exist scientific evidence or practical experience)

Decision 2008/896



7. Risk assessment grid (low risk situations)

■ Movements of animals (spread)

- APBs which do not deliver any animals for further farming, relaying or restocking (direct to human consumption)
- APBs which only deliver disinfected eggs (only if exist scientific evidence or practical experience)



Thanks for your attention

Dr Ignacio de Blas
Veterinary Faculty, Universidad de Zaragoza (Spain)
deblas@unizar.es

Contents adapted from original presentations of
Eric B Hudson and Dr Alain Le Breton