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GUIDANCE DOCUMENT

to assist Member States or the implementation of the criteria for

"Vector Protected Establishments" for bluetongue

laid down in Annex II of Commission Regulation (EC) No 1266/2007 as amended by
Commission Regulation (EC) No 456/2012 of 30 May 2012

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1. Introduction

The aim of this guidance document is to provide the competent authorities in the Member States and other stakeholders with background information, recommendations and different point of views, followed by examples of protocols from different Member States so they can assess their particular situation (i.e. epidemiologically/ climatically) and what implications this has on the implementation of a vector protected establishment.

This document is based on the input sent by Member States and the outcomes of discussions. In addition, passages were taken from the EFSA's Scientific Opinion on "bluetongue vectors and insecticides"¹

This document does not represent the official views of the Commission Services and should therefore not be considered as an "EU protocol for the implementation of a vector protected establishment" for bluetongue (nor for any other vector-borne diseases).

2. Background

The issue of "vector protection" and "vector proof" or "vector protected establishment" in relation to bluetongue disease has been a controversial subject in the past years. It has led to many discussions in the Standing Committee on the Food Chain and Animal Health (SCoFAH) and in technical working groups. While for one Member State the requirements for vector protection were not strict enough, other Member States indicated that stronger measures will not be realistic and will have major implications on trade.

Implementing Regulation 456/2012² amending Commission Regulation (EC) No 1266/2007³ (from here on: the bluetongue Regulation) introduces a new Annex II with criteria for the vector protected establishment based on the OIE Terrestrial Animal Health Code (2011). When the draft amending Regulation was presented for a vote in the SCoFAH of 3 April 2012, a number of representatives from Member States requested for a technical working group for the implementation of the vector protected establishment, with the aim to produce a guidance document. In response to this request the Commission organised a technical working group on 8 May 2012 to facilitate the discussions on the vector protected establishment and to gather existing information and experiences.

Draft versions of this document were distributed for comments on 3 August and 10 October 2012. Input in writing was received from Denmark, Germany, Finland, Romania, the Netherlands, France, Italy, Portugal, Spain and the United Kingdom. The EU reference laboratory for bluetongue (IAH Pirbright) also contributed to this document.

3. Vector protection in EU legislation in relation to bluetongue

3.1. "Animals were protected from vector attacks"

Up until the bluetongue Regulation came into force in 2007, prior approval of the Member State of destination was required for movement of animals from a bluetongue restricted zone to another

¹ Scientific Opinion of the Panel on Animal Health and Welfare on a request from the European Commission (DG SANCO) on Bluetongue. The EFSA Journal (2008) 735, 22-70

² Commission Regulation (EU) No 456/2012 of 30 May 2012 amending Regulation (EC) No 1266/2007 on implementing rules for Council Directive 2000/75/EC as regards the control, monitoring, surveillance and restrictions on movements of certain animals of susceptible species in relation to bluetongue. OJ L 141, 31.05.2012, p.7

³ Commission Regulation (EC) No 1266/2007 of 26 October 2007 on implementing rules for Council Directive 2000/75/EC as regards the control, monitoring, surveillance and restrictions on movements of certain animals of susceptible species in relation to bluetongue. OJ L 283, 27.10.2007, p. 37.

Member State. To "protect animals from vector attacks" has been an important measure in EU legislation on bluetongue since the year 2000 but because not everybody was reassured by the guarantees provided, many made use of the opportunity to refuse animals from a restricted zone.

After 1 November 2007, when the bluetongue Regulation came into force, it was no longer possible to refuse animals from restricted zones providing they met the requirements laid down in the Regulation (Article 8 and Annex III of the Regulation). This raised concerns by a number of Member States and the discussion about effective protection against vectors became more urgent.

Commission Regulation (EC) No 394/2008⁴ of 30 April 2008

This Regulation introduces transitional additional measures: Recitals (2), (3) and (4), and Article (9a):

"(2) In recent months, experience has shown that in a number of Member States the effectiveness of the measures provided for in Regulation (EC) No 1266/2007 to ensure the protection of animals against attacks by vectors might be undermined by a combination of factors, including the vector species, climate conditions and the type of husbandry of the susceptible ruminants;

(3) In view of those circumstances and pending their further scientific assessment, it is appropriate to allow Member States of destination, in which the introduction of non-immune animals under such circumstances could pose a risk for animal health to require that the movement of non-immune animals is subject to additional conditions justified on the basis of a risk assessment taking into account the entomological and epidemiological conditions in which animals are being introduced. Such additional conditions should be limited to what it is necessary to ensure an effective protection of non immune animals against vectors attack;

(4) The vector protected confinement of animals is a practicable and effective tool to protect younger animals from attacks by vectors provided that it is carried out subject to certain conditions. Therefore, Member States of destination should be allowed to require the application of these conditions in relation to the introduction of young, non-immune animals for which vaccination is not feasible. As this would affect intra-Community trade, the intention to apply these additional conditions should be notified to the Commission, together with all information demonstrating that it is justified."

"Article (9a): **Transitional measures.**

1. Until 31 December 2008, by way of derogation from Article 8(1)(a) and based on the outcome of a risk assessment taking into account the entomological and epidemiological conditions of the introduction of animals, Member States of destination may require that the movement of animals, which are covered by the exemption provided for in Article 8(1) and which comply with at least one of the conditions set out in points 1 to 4 of Section A of Annex III but which do not comply with points 5, 6 and 7 of that Section, comply with the following additional conditions:

- (a) those animals must be less than 90 days old;
- (b) they must have been kept since birth in vector protected confinement;
- (c) the tests referred in points 1, 3 and 4 of Section A of Annex III must have been carried out on samples taken not earlier than seven days before the date of the movement.

2. A Member State which intends to apply the additional conditions laid down in paragraph 1 shall notify the Commission in advance."

⁴ Commission Regulation (EC) No 394/2008 of 30 April 2008 amending Regulation (EC) No 1266/2007 as regards the conditions for exempting certain animals of susceptible species from the exit ban provided for in Council Directive 2000/75/EC. OJ L 117, 1.5.2008, p. 22.

Commission Regulation (EC) No 1304/2008⁵ of 19 December 2008

First prolongation transitional measures until 31 December 2009: Recitals (3), (4) (5) and (6):

"(3) Experience has shown that in a number of Member States the effectiveness of the measures provided for in Regulation (EC) No 1266/2007 to ensure the protection of animals against attacks by vectors might be undermined by a combination of factors. Those factors include the vector species, climate conditions and the type of husbandry of the susceptible ruminants;

(4) Therefore, as a transitional measure, Article 9a of Regulation (EC) No 1266/2007 as amended by Regulation (EC) No 394/2008 (3) provides that, until 31 December 2008, Member States of destination may require that the movement of certain animals which are covered by the exemption provided for in Article 8(1) of Regulation (EC) No 1266/2007 be subjected to additional conditions, on the basis of a risk assessment taking into account the entomological and epidemiological conditions in which animals are being introduced;

(5) In the period following the adoption of that transitional measure, experience has shown that in a number of Member States the application of the measures to ensure the protection of animals against attacks by vectors is not effective. In addition, the European Food Safety Authority states, in its Opinion on bluetongue of 19 June 2008 (4), that no treatment protocols have been formally approved in the Community for effectively protecting animals against *Culicoides* attacks;

(6) In view of those circumstances and pending further scientific assessment, it is appropriate to extend the period of application of the transitional measure laid down in Article 9a of Regulation (EC) No 1266/2007."

3.2. "Animals were protected from vector attacks in a vector proof establishment"

Commission Regulation (EC) No 789/2009⁶ of 28 August 2009

This Regulation introduces the "vector proof establishment": Recital (3):

"(3) Experience has shown that the requirements laid down in Regulation (EC) No 1266/2007 aimed at preventing the exposure of animals to vectors can be difficult to apply. However, under certain conditions, in establishments such as artificial insemination centres or quarantine stations, it may be possible to prevent the exposure of animals to vectors. The protection against attacks by vectors should not solely depend on the use of insecticides and/or repellents but should also require that the animals are kept inside a vector proof establishment where additional measures, in particular a combination of appropriate physical barriers and chemical (insecticides and/or repellents) treatments, are taken to prevent contact between the animals and the vectors. The absence of vectors may be verified by operating vector traps inside such establishments."

Commission Regulation (EC) No 1156/2009⁷ of 27 November 2009

Second prolongation transitional measures until 31 December 2010: Recitals (4), (5) and (6):

"(4) The overall disease situation in the Community as regards bluetongue has improved considerably

⁵ Commission Regulation (EC) No 1304/2008 of 19 December 2008 amending Regulation (EC) No 1266/2007 as regards the conditions for exempting certain animals of susceptible species from the exit ban provided for in Council Directive 2000/75/EC. OJ L 344, 20.12.2008, p. 28.

⁶ Commission Regulation (EC) No 789/2009 of 28 August 2009 amending Regulation (EC) No 1266/2007 as regards protection against attacks by vectors and minimum requirements for bluetongue monitoring and surveillance programmes. OJ L 227, 29.8.2009, p. 3.

⁷ Commission Regulation (EC) No 1156/2009 of 27 November 2009 amending Regulation (EC) No 1266/2007 as regards the conditions for exempting certain animals of susceptible species from the exit ban provided for in Council Directive 2000/75/EC. OJ L 313, 28.11.2009, p. 59.

in 2009. However the virus is still present in parts of the Community;

(5) In addition, the effectiveness of the measures laid down in Regulation (EC) No 1266/2007 is influenced by a combination of factors. Those factors include the vector species, climate conditions and the type of husbandry of the susceptible ruminants;

(6) It is therefore appropriate to continue to apply the transitional measure set out in Article 9a of Regulation (EC) No 1266/2007, taking into account that the disease situation is not stable and still evolving. Regulation (EC) No 1266/2007 should therefore be amended accordingly."

Commission Regulation (EC) No 1142/2010⁸ of 7 December 2010

Third prolongation transitional measures until 30 June 2011: Recital (3), (4), (5) and (6):

"(3) Article 9(a) of Regulation (EC) No 1266/2007 provides that, until 31 December 2010, and by way of derogation from the conditions set out in Annex III to that Regulation, Member States of destination may require that the movement of certain animals which are covered by the exemption, provided for in Article 8(1) thereof, be subjected to additional conditions, on the basis of a risk assessment taking into account the entomological and epidemiological conditions in which animals are being introduced. Those additional conditions specify that the animals must be less than 90 days old, they must have been kept since birth in vector protected confinement and they must have been subject to certain tests referred to in Annex III to that Regulation;

(4) Fifteen Member States and Norway have notified the Commission that they have applied that transitional measure. The outcomes of the risk assessments that were carried out, which are publicly available on the Commission's website, show that the introduction of bluetongue in those Member States and in Norway as a result of animal movements from restricted zones could have a major negative impact;

(5) The overall disease situation as regards bluetongue has improved considerably since 2008. However the virus is still present in parts of the Union;

(6) For the sake of harmonized implementation, Member States have requested for specific criteria for the 'vector proof establishment' which is an important requirement for a number of the conditions set out in Annex III of Regulation (EC) No 1266/2007 and aims at the protection of animals against attacks by vectors. Currently, the World Organization for Animal Health (OIE) is working on a definition of a vector-protected establishment or facility. The outcome of this work shall serve as input for the Commission to define criteria for the vector proof establishment as referred to in Annex III of the Regulation."

Commission Regulation (EC) No 648/2011⁹ of 4 July 2011

This Regulation prolonged for the third and final time the transitional measures until 30 June 2012.

3.3. "Animals were protected from vector attacks in a vector protected establishment"

Implementing Regulation (EC) 456/2012 of 30 May 2012

Introducing criteria for "vector protected establishment": Recital (12) and (13):

⁸ Commission Regulation (EU) No 1142/2010 of 7 December 2010 amending Regulation (EC) No 1266/2007 as regards the period of application of the transitional measures concerning the conditions for exempting certain animals from the exit ban provided for in Council Directive 2000/75/EC. OJ L 322, 8.12.2010, p. 20.

⁹ Commission Implementing Regulation (EU) No 648/2011 of 4 July 2011 amending Regulation (EC) No 1266/2007 as regards the period of application of the transitional measures concerning the conditions for exempting certain animals from the exit ban provided for in Council Directive 2000/75/EC. OJ L 176, 5.7.2011, p. 18.

"(12) Keeping bluetongue susceptible animals in a vector proof establishment for a specified period of time is an important requirement for certain conditions for exemptions from the exit ban as set out in Annex III of Regulation (EC) No 1266/2007. Experience shows that it is difficult for Member States to establish proper criteria for the implementation of a vector proof establishment for regular movements for trade in animals of susceptible species such as cattle, sheep and goats;

(13) In order to improve the effectiveness of vector proof establishments and to assist the Member States in their implementation of that control measure, a number of criteria should be established. Those criteria should be based on experiences of the Member States and the Terrestrial Animal Health Code of the World Organisation for Animal Health (OIE). To align the terminology with the OIE, the term 'vector proof establishment', currently used in Regulation (EC) No 1266/2007, should be replaced by 'vector protected establishment.'

4. Implementation of vector protection for bluetongue disease

The criteria for the 'vector protected establishment' are laid down in Annex II of the bluetongue Regulation as amended by Commission Regulation (EC) No 456/2012 (see [Annex 1 of this document](#)) and are based on those in the OIE Terrestrial Animal Health Code (2011) (see [Annex 2 of this document](#)).

"1. A vector protected establishment shall at least comply with the following:

- (a) it must have appropriate physical barriers at entry and exit points;*
- (b) openings of the vector protected establishment must be vector screened with mesh of appropriate gauge which must be impregnated regularly with an approved insecticide according to the manufacturers' instructions;*
- (c) vector surveillance and control must be carried out within and around the vector protected establishment;*
- (d) measures must be taken to limit or eliminate breeding sites for vectors in the vicinity of the vector protected establishment;*
- (e) standard operating procedures must be in place, including descriptions of back-up and alarm systems, for operation of the vector protected establishment and transport of animals to the place of loading.*

2. The competent authority shall approve an establishment as vector protected, if the criteria in point 1 are met. It shall verify at the appropriate frequency, but at least three times during the required protection period (at the beginning, during and at the end of the period) the effectiveness of the measures carried out by means of a vector trap inside the vector protected establishment."

This chapter provides more information on the several separate aspects that are important for the implementation of the vector protected establishment. It first summarises some general considerations (4.1), followed by specific explanations and considerations with regard to the building requirements (4.2) and finally some options for the official approval and checks (4.3).

The information and examples in this chapter are merely intended as guidance and do not represent additional criteria to Annex II. It is the responsibility of the Member States' competent authorities to implement the appropriate measures.

4.1. General considerations

a. Expected use of the vector protected establishment

Member States indicated that meeting the criteria for the vector protected establishment involves significant investment in adaptations to livestock buildings and in the management of livestock kept

within the establishment. It has therefore often been suggested that the construction and use of such accommodations is only likely to be worthwhile for high value livestock or artificial insemination centres for which other means of exiting the restriction zone (i.e. vaccination, natural immunity or movement during a vector free period) are not an option.

At the moment, Italy has about 15 approved vector protected establishments for bluetongue. Spain also uses vector protected establishments, which are generally already existing buildings which have been adapted to keep the vectors out. Annex 3 of this document contains more specific information about the practical implementation of the vector protected establishments in [Italy](#) and [Spain](#). Please note that this information was provided before the adoption of the new Annex II, and that the protocols have not been verified to check consistency with the current requirements.

b. Keeping the animals

The EFSA opinion on vectors and insecticides states that "keeping animals day and night in stables protected by nets will probably be the best way to protect them from the vector attacks and therefore to prevent BTV transmission to animals due for export."

An issue to consider is the animals' well-being when they are housed in vector protected establishments for periods that may theoretically extend to 60 days. Not all animal species are suitable for long term housing.

In addition, in certain Member States the warm climate is not favourable to permanently house groups of ruminants. The design of facilities should therefore pay special attention to providing sufficient ventilation and could include the use of dedicated air conditioning.

c. Competent vector

In designing and approving a vector protected establishment, special attention should be paid to the characteristics of the competent vector(s) -if known- of the circulating serotype(s): taking into account the feeding and breeding patterns and the preference of indoor versus outdoors. For example it is known that *C. imicola* prefers to remain outside, while *Obsoletus complex* species can also be found in relative large numbers inside the stables.

In 2008, the EFSA Opinion on vectors and insecticides recommended that "Analyses of the vector competence of particular species should be conducted with reference not only to the ability of the vector to become infected by, replicate and transmit the virus but also to its wider ecological requirements (i.e. its vector capacity), which may vary with region and season."

Feeding behaviour is in general influenced by the season, the presence and abundance of hosts, and local weather. Field studies showed that there are wide variations in behaviour, sometimes even within the same species. A key difficulty in interpreting these studies is the fact that the degree of enclosure examined is poorly described in almost all cases. Hence, what is described as 'indoor presence' can range from open sided sheds containing cattle to smaller stables holding equines that provide vastly more protection. To date the evidence points to at least some activity of this type in the northern European *C. obsoletus* group at the end of the adult flight season (September-November) but little activity in the primary southern European vector of BTV, *C. imicola*.

Finally, it is very important to keep in mind that only a small proportion of the species responsible for BTV transmission have been identified. Other species than species belonging to the *Obsoletus* or *Pulicaris* groups or *C. imicola* may be locally or at certain periods of interest for transmission

d. Vector activity

The factor "vector activity" is linked to the competent vector(s) as described above. *Culicoides* are

often described as being primarily crepuscular, meaning active primarily during dawn and dusk, although it is known that a proportion of some species can bite during the day.

It appears that *C. obsoletus* is mainly active around sunset and sunrise, modulated by seasonality. Particular climatic conditions (sudden drop in light intensity associated with overcast conditions) can allow activity, for example in the middle of the afternoon. There are also specific species such as *C. brunnicans* and *C. nubeculosus* that appear to have a higher tolerance for activity during the day.

The EFSA Opinion on vectors and insecticides recommends that further research is in order to estimate the relevance of the indoor and day-light activity in either the extension or reduction of the seasonal pattern of the different vector *Culicoides* species. Indoor and day-light activities should be defined and standardized for research purposes.

e. Virus circulation

According to EU legislation, a vector protected establishment is only relevant in a restricted zone for bluetongue, as defined in Article 2(d) of Commission Regulation (EC) No 1266/2007. Within these zones, the level of virus circulation can vary from very high (e.g. in the middle of the vector season during an epidemic) to zero (e.g. during low vector activity or in areas where the disease has already been eradicated due to vaccination). When the vector protected establishment is located in an area with high virus circulation, it is even more important that the measures taken to protect the animals from vectors are effective.

f. Relevance for other *Culicoides* transmitted diseases

Besides bluetongue, there are additional animal diseases that are transmitted by *Culicoides*, such as African Horse Sickness (another listed and notifiable OIE disease), Epizootic haemorrhagic disease and viruses of the Simbu serogroup, (for example Akabane and Schmallenberg virus). This guidance document may provide useful information in relation to those diseases; however it exclusively aims to give guidance for the implementation of vector protected establishments related to bluetongue.

4.2. Building requirements

The following elements regarding the building are mentioned in point 1 of Annex II of Regulation 1266/2007: (a) physical barriers to vectors at entry and exit, (b) insecticide impregnated vector screens, (c) vector surveillance and control carried out within and around the vector protected establishment, (d) measures to limit or eliminate potential breeding sites and finally, (e) standard operating procedures.

It is not always financially feasible to design and build animal housing specifically to be used as a vector protected establishment and therefore it is to be expected that in most cases an existing building will be converted to meet the requirements. In that case, it is preferred that the building has walls all around and a roof that covers the whole building; an open-sided barn, even when completely shielded with nets, is more difficult to protect from *Culicoides*. Another option is to construct the vector protected establishment as a compartment within a building.

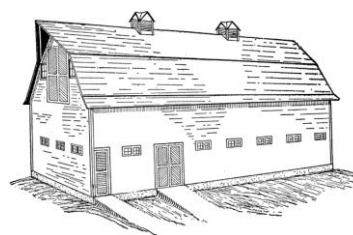


Illustration 1: four walls and a roof

a. Physical barriers/ Entry system

The main purpose of the vector protected establishment is to prevent the entry of *Culicoides* and avoid host-vector contact. The primary threat of vector entry arises from outside the establishment; therefore the establishments need to be sufficiently closed to prevent this.

A safe option is to install a double door entry-exit system system, which is used as an example in the OIE recommendations for the vector protected establishment. The room between the doors must be large enough to accommodate any person, animal or object likely to enter or leave the facility during the protection from vector attack period. The inner and the outer door should never be opened at the same time. For increased security, a trap or an insect electrocution device could be placed in the room between the doors.

Alternative or additional systems such as positive pressure ventilation within the establishment or through the use of 'air curtains' that forcefully blow air downwards over entry points to prevent vectors from gaining access could also be effective.

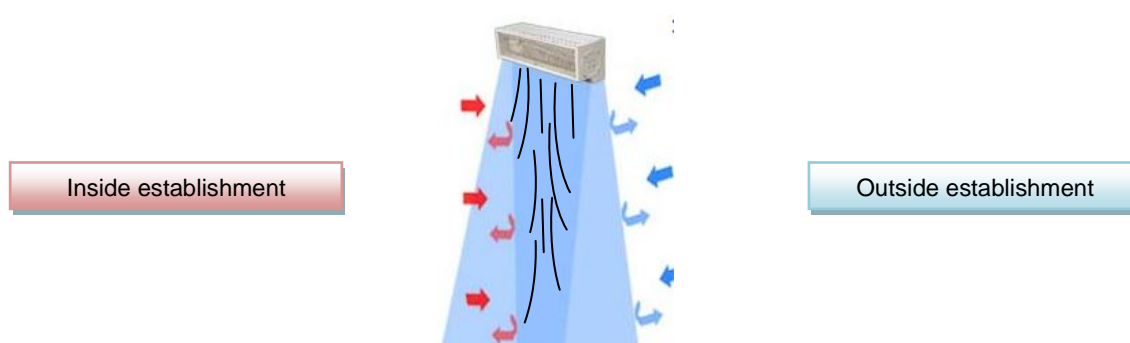


Illustration 2: Air curtain

b. Insecticides impregnated screens

In the EU, the vast majority of products used for the control of *Culicoides* use synthetic pyrethroid active components, due to the withdrawal of authorizations for insecticides belonging to other chemical families (e.g. organochlorines, organophosphates and carbamates). Unfortunately, the efficacy studies have mostly been carried out on other arthropod pests e.g. flies and ticks and therefore the effects on *Culicoides* are not clear.

Of course it needs to be ensured that the product is safe for use in animal housing, for the animals as well as the animal handlers. Insecticide treatment should not be performed more frequently than recommended by the manufacturer. More frequent use or using at excessive levels could lead to toxicity and will result in increased environmental harm with no increased benefit.

Screens used for mosquitos (usually 5mm mesh) are ineffective because *Culicoides* are smaller in size and a closer mesh is needed. This may represent a significant problem for providing proper ventilation within the establishment. The material of the screens is important: experience from work on other vector groups has shown that nylon screens are preferred as the insecticidal effect in general lasts longer.

Aside from using screens to cover the openings of the vector protected establishment, it has also been suggested to place a protective barrier of netting impregnated with insecticide around the windows (at a distance of 1,5 or 2 meters from them).

As an additional measure, the use of specific paint with long lasting repellents (such as Inesfly) could be used on the walls of the vector protected establishment.

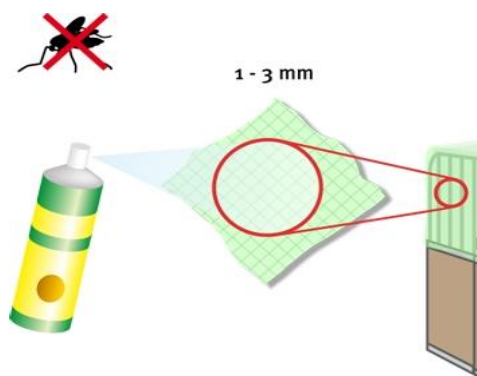


Illustration 3: impregnated screens
(source: Dutch Ministry of Economic affairs, Agriculture and Innovation)

c. Surveillance of the vector

According to point 1(c) of Annex II to Regulation (EU) No 456/2012, "vector surveillance and control must be carried out within and around the vector protected establishment". And point 2 says that the effectiveness of the measures must be verified by means of a vector trap inside the vector protected establishment at least three times during the required protection period (at the beginning, during and at the end of the period)."

The "required protection period" refers to the number of days that are mentioned in points 2, 3, and 4 of part A, point (b) of part B and point 2(b) of part C in Annex III of the bluetongue Regulation (where the animals should be protected against attacks from the vector for at least 14, 28 or 60 days, respectively).

According to all experts, the traps to be used for surveillance should be ultraviolet light traps, specifically designed or recommended for trapping of *Culicoides* (for example OVI or CDC models). The standard traps which are used for larger flies tend to not have a suction unit and rely upon killing the insects using electric grids.



Illustration 4: light trap for catching *Culicoides*
(source: IAH, Pirbright)

For setting up the surveillance plan for a vector protected establishment, the following is advised:

Within the vector protected establishment:

- The number of traps in a vector protected establishment should be established by the competent authorities and is dependent upon the specific features of the vector protected establishment (e.g. conditions in the area, size of the establishment, (number and types of) openings, number

- of animals, etc.)
- The position of the trap: it is recommended to have one in both the room between the double door system (if present) and the main stable. The light of the trap will be more effective between the doors due to confinement and the lack of light for long periods. The efficacy of the trap in the main stable will vary hugely due to competing light sources, proximity to animals, etc.
 - The frequency of operating vector traps as described in the Annex (at least three times: at the beginning, during and at the end of the required protection period) seems to be a good minimum. However, certain experts advocate a continuous system of trapping. In Italy, weekly collections of the inside trap is considered sufficient to monitor the "zero regime".
 - As regards the length of trapping sessions, Spain advises to operate the trap each time for 2 consecutive nights/ fortnightly. In Italy, the collection of *Culicoides* has to be performed for at least 10 consecutive days during the period of vector activity.
 - If an inside trap contains other flying insects (other than *Culicoides*, for example house-flies), this may be an indication that something is wrong and the standard operating procedures and physical barriers should be checked.

Around the vector protected establishment:

- For vector surveillance around the vector protected establishment, relying on the national vector surveillance programme (if there is one in place) is considered insufficient. Traps should rather be placed in the immediate surroundings of the vector protected establishment.
- A standardisation of approach, such as one trap per $x \text{ m}^2$, based on expert opinion or evidence can provide additional confidence in negative results.
- There is no common advice on the frequency of trapping outside, but this could at least be done at the same minimum frequency for inside (3x). If the vector protected establishment is used during the adult season of the vector, weekly or even continuous surveillance is advised.
- Experience shows that in particular for outside surveillance, operating the vector trap for only one night per session is insufficient. A windy night may give a false sense of security. For this reason, Italy uses at least 10 trapping days per session.
- The surveillance plan may also specify conditions suitable for surveillance of vector activity i.e. $>12^\circ\text{C}$ / $< 4\text{mps}$ wind speed / no heavy rain.

d. Eliminating/ limiting breeding sites of the vector

The identification of breeding sites on a farm is a very time-consuming work, requiring expertise in capturing and identifying *Culicoides*. Currently, breeding sites are described as organically enriched matter from decaying vegetation (often used as compost), soil contaminated by animal faeces, cattle dung, leaf litter and a range of wetland habitats. Adequate and regular waste/manure management is to be encouraged to reduce habitats that may be used as larval habitat.

Recently, *C. obsoletus/scoticus* larvae have also been found in maize silage residues. *C. dewulfi* and *C. chiopterus* on the other hand breed directly in cattle dung pats. The major breeding sites of *C. montanus* across Europe remain largely unknown or unconfirmed.



Illustration 5: Remove and cover manure
 (source: Dutch Ministry of Economic affairs, Agriculture an Innovation)

According to the EFSA Opinion on vectors and insecticides, the breeding sites of *C. imicola* have been clearly identified at the farm level. Moist soil enriched with organic matter appears to be the most suitable habitat for larval development. The breeding sites for *C. obsoletus/C. scoticus* include a wide variety of habitats, including forest leaf litter, stagnant water and marshy areas, horse dung (but not cow dung), and heaps of garden compost.

EFSA concludes that dung removal/treatment especially in countries with Mediterranean climate when feasible and practical has the potential to reduce populations of *C. imicola*. Additionally, preventing overflow of water from water troughs and leaking water installations and keeping the animal premises as dry as possible would prevent/reduce creation of developmental sites of *C. imicola*.



Illustration 6: no puddles of water
 (source: Dutch Ministry of Economic affairs, Agriculture an Innovation)

Table 1 summarises the findings of EFSA on the main characteristics of certain potential Culicoides vectors for bluetongue in Europe.

Table 1. Summary of the main conclusions on potential *Culicoides* vectors of BTV in Europe. Much of this information is based on collections of *Culicoides* using light traps only.

Species	Easy to identify morphologically on wing pattern*	Virus studies	Virus isolation/PCR detection	Abundance in Mediterranean Europe	Abundance in temperate Europe	Breeding sites	Diurnal activity recorded	Indoor/Outdoor presence recorded
<i>Culicoides imicola</i>	Yes	Field	+/-	+++	-	Sun-exposed organically enriched mud in the farmyard	-	+/-
Obsoletus complex	Yes	Field/Lab	+/-	+++	+++	Forest, organically enriched soil.	+	+/-
<i>C. dewulfi</i>	No	Field	+/-	+	+++	Dung pats	+	+/-
<i>C. chiopterus</i>	Yes	Field	+/-	+	+++	Dung pats	+	+/-
Pulicaris complex	Yes	Field/Lab	+/-	+++	+++	Sun-exposed,	-	+/-
<i>C. pulicaris</i>	No	Field	+/-	+	+(-)	vegetated,	-	
<i>C. newsteadi</i>	Yes	Field	+/-	+++	+	organically enriched,	-	
<i>C. lupicaris</i>	No	Field	+/-	(-)	(+)	enriched,	-	
<i>C. punctatus</i>	Yes	Field	+/-	+(+)	+++	saturated mud in the farmyard	-	

* Individual species of *Culicoides* are relatively easy to assign to the correct species complex, but more difficult to identify down to species level (e.g. *Culicoides obsoletus/scoticus*)
+ low abundant species; +++ high abundant species; (+) and (-): suspected according to expert's opinion but not confirmed by references

Table 1. Summary of characteristics of *Culicoides* that are possible vectors for bluetongue (Source: the EFSA Journal (2008) 735, p. 21)

In northern Europe, targeting of larval habitats is more difficult due to the wide range of habitats used by potential vector species. While some species are restricted to dung and hence could be targeted by removal of these habitats, this only reduces probability of transmission by these species and not others utilising less specific larval development sites.

As regards the use of insecticides or chemical treatment, according to at least one study, insecticide treatment of the environment with currently available products is ineffective and has adverse consequences for the environment and in particular to non-target fauna. Inside the vector protected establishment, bedding needs to be cleaned on a regular basis. Treating the fresh bedding with insect growth inhibitors, such as pyriproxyfen is a controversial measure because they are very toxic to insect life in rivers and streams as well as pollinators. There is EU legislation in place to limit the use of these products. In addition, there is no specific evidence for the effectiveness with *Culicoides*.

e. Standard operation procedures

The term "Standard operating procedures" refers to a set of written instructions that document a routine or repetitive activity. The development and use of these standard procedures are an important because they describe how to perform all steps properly, and they facilitate consistency in the quality and integrity of the end-result.

Apart from operating procedures for the vector protected establishment, the development of operating procedures for the transport of the animals from the vector protected establishment to the place of loading is also of relevance. It should take place in a period of the day with low vector activity, if possible in full day light. The transport vehicle should be placed as close to the door as possible and animals should be treated with insecticides.

4.3. Approval and control

According to point 2 of Annex II, the competent authority shall approve an establishment as vector protected, if the criteria in point 1 are met and shall verify, at the appropriate frequency, but at least

three times during the required protection period (at the beginning, during and at the end of the period) the effectiveness of the measures carried out by means of a vector trap inside the vector protected establishment.

a. Approval of establishment

According to certain experts, the approval needs to be given every single time right before animals are confined, rather than not for a defined period (for example for a whole year) because the circumstances evolve over time. A number of factors such as the level of virus circulation (high vector activity/ many outbreaks) in the surrounding area should play a role in the assessment for approval of the vector protected establishment.

It is also suggested that competent authorities should include the level of virus circulation (high number of vectors and high number of outbreaks) in the assessment for approval of the vector protected establishment. In addition to the numbers of vectors and outbreaks, historical results of an on-going vector monitoring programme can be included for a more reliable assessment.

As regards the appropriate facilities of the establishment, Italy uses as a basis the same requirements as for the approval of assembly centres for bovine animals and swine (Article 11 of Council Directive 64/432/EEG). The administrative procedures for the approval of vector protected establishment can be similar to those that are already in place for approving other centres or establishments.

It is suggested by some Member States that for reasons of transparency, a list of approved vector protected establishments should be published on the national website of the competent authority.

b. Verifying the effectiveness of the protection

Verification of the effectiveness of the protection by means of a vector trap inside the vector protected establishment is to be carried out by the competent authority at least three times during the required protection period, in conformity with Annex II. There is general consensus that the person who handles this trap and registers the data should be the official of the competent authority or a representative thereof.

A possible scenario is that, in addition to the three checks performed by the competent authority, the protection effectiveness is checked weekly by the business operator by operating and emptying the traps in and outside the vector protected establishment. This data will be collected and provided to the authority representative at the end of the protection period. Following the evaluation of these two types of data, the competent authority will conclude if the protection of animals is appropriate and if the consignment may be dispatched.

5. Useful reading

- 1) Papadopoulos, E., D. Bartram, S. Carpenter, P. Mellor, and R. Wall. 2009. Efficacy of alphacypermethrin applied to cattle and sheep against the biting midge *Culicoides nubeculosus*. *Veterinary Parasitology* 163: 110-114.
- 2) Carpenter, S., P. S. Mellor, and S. J. Torr. 2008. Control techniques for *Culicoides* biting midges and their application in the UK and northwestern Palaeartic. *Medical and Veterinary Entomology* 22: 175-187.
- 3) Venail, R., B. Mathieu, M. L. Setier-Rio, C. Borba, M. Alexandre, G. Viudes, C. Garros, X. Allene, S. Carpenter, T. Baldet, and T. Balenghien. 2011. Laboratory and Field-Based Tests of Deltamethrin Insecticides Against Adult *Culicoides* Biting Midges. *Journal of Medical Entomology* 48: 351-357.
- 4) Baldet T, Delecolle JC, Cetre-Sossah C, Mathieu B, Meiswinkel R, Gerbier G. Indoor activity of *Culicoides* associated with livestock in the bluetongue virus (BTV) affected region of Northern France during autumn 2006. *Prev Vet Med.* 2008 Oct;87(1-2):84-97.
- 5) Jamnback, H. (1961) The effectiveness of chemically treated screens in killing annoying punkies, *Culicoides obsoletus*. *Journal of Economic Entomology* 54, 578-580.
- 6) Dukes, J.C. & Axtell, R.C. (1976) Residual effectiveness of insecticide-treated screens for control of biting midges, *Culicoides furens* (Poey) (Diptera, Ceratopogonidae). *Mosquito News*, 36, 488-491.
- 7) Meiswinkel, R., Baylis, M. & Labuschagne, K. (2000) Stabling and the protection of horses from *Culicoides bolitinos* (Diptera: Ceratopogonidae), a recently identified vector of African horse sickness. *Bulletin of Entomological Research*, 90, 509-515.
- 8) Weinburgh, H.B. & Pratt, H.D. (1962) *Culicoides* – public health importance, biology, survey and control. *Training Guide, Insect control series, CDC Atlanta, Georgia*. 17pp.

ANNEXES

The protocols in Annex III are added to this document as examples of different approaches; they have not been checked for consistency with the current requirements.

Please also note that these protocols were established before the adoption of the new criteria for vector protected establishments in Annex II of the bluetongue Regulation.

Annex 1
**Criteria for the Vector protected establishment in Commission
Regulation (EC) No 1266/2007**

31.5.2012

EN

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COMMISSION IMPLEMENTING REGULATION (EU) No 456/2012

of 30 May 2012

amending Regulation (EC) No 1266/2007 on implementing rules for Council Directive 2000/75/EC
as regards the control, monitoring, surveillance and restrictions on movements of certain animals of
susceptible species in relation to bluetongue

(Text with EEA relevance)

‘ANNEX II

**Criteria for the “vector protected establishment” (referred to in points 2, 3 and 4 of Section A of Annex III,
point (b) of Section B and point 2(b) of Section C in that Annex)**

1. A vector protected establishment shall at least comply with the following:
 - (a) it must have appropriate physical barriers at entry and exit points;
 - (b) openings of the vector protected establishment must be vector screened with mesh of appropriate gauge which must be impregnated regularly with an approved insecticide according to the manufacturers' instructions;
 - (c) vector surveillance and control must be carried out within and around the vector protected establishment;
 - (d) measures must be taken to limit or eliminate breeding sites for vectors in the vicinity of the vector protected establishment;
 - (e) standard operating procedures must be in place, including descriptions of back-up and alarm systems, for operation of the vector protected establishment and transport of animals to the place of loading.
2. The competent authority shall approve an establishment as vector protected, if the criteria in point 1 are met. It shall verify at the appropriate frequency, but at least three times during the required protection period (at the beginning, during and at the end of the period) the effectiveness of the measures carried out by means of a vector trap inside the vector protected establishment.’;

Annex 2

Vector protection from *Culicoides* in the OIE Terrestrial Animal Health Code (2011)

Article 8.3.15.

Protecting animals from *Culicoides* attack

1. Vector-protected establishment or facility

The means of protection of the *establishment* or facility should at least comprise the following:

- a) Appropriate physical barriers at entry and exit points, e.g. double-door entry-exit system;
- b) openings of the building are *vector* screened with mesh of appropriate gauge impregnated regularly with an approved insecticide according to the manufacturers' instructions;
- c) *vector surveillance* and control within and around the building;
- d) measures to limit or eliminate breeding sites for *vectors* in the vicinity of the *establishment* or facility;
- e) standard operating procedures, including description of back-up and alarm systems, for operation of the *establishment* or facility and transport of *animals* to the place of *loading*.

2. During transportation

When transporting *animals* through BTV infected countries or *infected zones*, *Veterinary Authorities* should require strategies to protect *animals* from attack from *Culicoides* during transport, taking into account the local ecology of the *vector*.

Potential *risk management* strategies include:

- a) treating *animals* with insect repellents prior to and during transportation;
- b) *loading*, transporting and *unloading animals* at times of low *vector* activity (i.e. bright sunshine, low temperature);
- c) ensuring *vehicles* do not stop en route during dawn or dusk, or overnight, unless the *animals* are held behind insect proof netting;
- d) darkening the interior of the *vehicle*, for example by covering the roof and/or sides of *vehicles* with shade cloth;
- e) *surveillance for vectors* at common stopping and offloading points to gain information on seasonal variations;
- f) using historical information and/or information from appropriately verified and validated BTV epidemiological models to identify low risk ports and transport routes.

Annex 3
Examples of protocols from Member States

A. Italy

PROCEDURE FOR AUTHORIZING IN ITALY THE “QUARANTINE STATIONS” FOR PROTECTING ANIMALS FROM *CULICOIDES* ATTACK.

The “quarantine station” for cattle and for the other bluetongue susceptible species must comply with the following requirements:

- to be in compliance with the requirements of the Council Directive 97/12/EC, and in particular it must have:
 - a facility dedicated exclusively for assembling the animals for trade,
 - appropriate facilities for loading, unloading and adequate housing of a suitable standard for the animals, for watering and feeding them, and for giving them any necessary treatment; these facilities must be easy to clean and disinfect,
 - appropriate inspection facilities,
 - appropriate isolation facilities,
 - appropriate equipment for cleaning and disinfecting rooms and trucks,
 - an appropriate storage area for fodder, litter and manure,
 - an appropriate system for collecting waste water,
 - the use of an office for the official veterinarian,
- to be cleaned and disinfected before use, as required by the official veterinarian,
- to admit only animals that are identified and come from herds that are officially free of tuberculosis, brucellosis and leucosis, and to keep the animals exclusively in the premises specifically dedicated to them, without any possibility of going outside, during all the time they are in the station,
- to rigorously perform the checks and the notifications according to the national and community rules for the animal identification and registration,
- to be provided with window nets with 1 mm mesh and with other devices to prevent the entry of insects and, in particular, *Culicoides*.

The authorization for the “quarantine stations” is issued by the Regional Veterinary Service, on the basis of the following procedure:

1. the applicant sends an authorization claim to the competent local veterinary service, with the indication of all information needed for a precise and unique identification of the holding: identification code, denomination, address, name and surname of the keeper, name and surname of the owner, latitude and longitude, maximum number of cattle or sheep and goats for which the authorization is requested.
2. The local veterinary service carries out an inspection on the spot for verifying the compliance with the requirements ruled out by the Council Directive 97/12/EC, with particular reference to what is specifically listed above. In addition, the local veterinary service verifies the positioning of nets and the installation of all other devices for preventing the entry of *Culicoides*. In case the results of the inspection are favourable, the local veterinary service sends to the Regional Veterinary Service the following documents:
 - a. a copy of the authorization claim,
 - b. the certificate of compliance with the requirements ruled out by the Council Directive 97/12/EC,
 - c. a report in which a description of the devices installed for preventing the entry of *Culicoides* is provided.

3. The Regional Veterinary Service, in collaboration with the competent Istituto Zooprofilattico Sperimentale, proceeds to further controls, and set out the check on the degree of protection from *Culicoides* attack. In particular, at least 2 traps are located in the premise, one in-door and another out-door. The collection of *Culicoides* has to be performed for at least 10 consecutive days during the period of vector activity.
4. The competent Istituto Zooprofilattico Sperimentale transmits to the Regional Veterinary Service a technical report on the degree of protection to *Culicoides* attack in the holding. The favorable opinion must be supported by the results of the *Culicoides* collections, which have to prove that:
 - the total number of insects collected inside the premise is significantly lesser than the same number obtained outside the structure,
 - no *Culicoides* are collected inside the premise.

The Regional Veterinary Service, on the basis of the documentation received, will issue or deny the authorization, within 30 days from the receipt of the complete dossier.

A copy of the authorization act must be sent to:

- the applicant,
- the local veterinary service,
- the General Directorate of Animal Health and Veterinary Medicinal Products, which will include the holding into the national list of quarantine stations, and will give communication of this inclusion to the owner of the holding, to the Regional Veterinary Service and to the local veterinary service. The holding can start its activities, as quarantine station, only after the communication of the inclusion into the national list.

A *Culicoides* trap is maintained in the station and in-door captures are performed weekly to monitor the “zero regime”.

The authorization is valid for one year. The validity period has to be annual re-evaluated by the Regional Veterinary Service, on the basis of a annual report prepared by the local veterinary service after a new inspection in the holding to verify the maintenance of the compliance with the requirements ruled out for the quarantine stations, including that related to the degree of protection from *Culicoides* attack.

B. Spain

Introduction

Criteria for setting up livestock facilities that are protected against bluetongue vectors.

Knowledge of the biology and control of bluetongue vectors has advanced in recent years, enabling us to adopt a different approach to the protection of animals within livestock buildings against being bitten by the vectors of this disease.

First of all, we now know that the main vectors of bluetongue in Spain are two species of midges with different distributions and patterns of behaviour. *Culicoides imicola* is common throughout nearly all of Andalusia, Extremadura, Castilla La Mancha, the south of the Community of Madrid, the south of the province of Avila and the Balearic Islands. Its activity varies depending on the area and from year to year, but it is most abundant from the end of May/beginning of June to the beginning of November. It has been found to enter farms, but apparently only if there is no easy source of food available outside. Its endophilia seems to depend on the absence of physical barriers to its entry and the absence of animals outside farms.

In recent years, however, it has been discovered that although *Culicoides imicola* displays a marked preference for external (exophilic) food sources, it can also penetrate livestock buildings containing livestock even if mosquito nets have been fitted to the windows. The study cited was unable to determine whether its presence within the buildings was endophilic or because there were no animals grazing freely outside the buildings. Its entry into farms seems to be also dependent on its external density. According to the little that is known about its larval habitats, its larvae develop in muddy areas, where their breeding grounds certainly tend to be found, but its ability to travel makes up for this restriction in its breeding grounds.

Culicoides obsoletus comprises a number of species, according to the work carried out in Spain mainly *Culicoides obsoletus* sensu stricto, *Culicoides scoticus* and occasionally *Culicoides dewulfi*. It is found throughout nearly all of Spain, but is especially common in the northern half of the Iberian Peninsula, including the Mediterranean coast, the Balearic Islands, the Canary Islands and high-altitude areas in the southern half of the peninsula. It is active for a very long period and can be captured throughout the year, especially in farms that also contain suitable breeding grounds. It is found only to a very limited extent in the Mediterranean area of Murcia, Alicante and Valencia and various provinces of Andalusia.

Measures

Quarantine should be carried out a long way away from ponds or flooded areas. Clean up the area if possible. Repair leaks in drinking troughs outside farms.

To avoid transmission inside farms:

- Wherever possible, carry out quarantine in areas where *Culicoides* is known to be not very common. There is always the risk of midges being transported by the wind.
- The facilities must have barriers to protect against entry by *Culicoides*. Do not have big windows.
- Clean bedding on a regular basis and prevent the leakage of water from drinking troughs and piping to avoid creating areas in which any of the species belonging to *Culicoides obsoletus* might breed inside quarantine facilities. They are attracted by the smell of dung in stables. Treat bedding with IGR growth inhibitors, such as pyriproxyfen.
- Install mosquito nets with mesh apertures of 5 mm and spray them with insecticides such as

pyrethroids, which are also repellent.

- Reduce animal density at farms to avoid problems of animal welfare when installing nets with a dense mesh.
 - Paint the walls using paints such as Inesfly containing insecticides such as alfa cypermetrina, clorpyrifos or diazinon both inside and outside buildings. In the laboratory, such paints have been shown to remain effective for over a year.
 - Placing physical barriers such as netting three metres high around the area containing animals significantly reduces the presence of *Culicoides* and other blood-sucking dipterans in the protected area. The effect is even more pronounced if the netting is sprayed with insecticide. It is recommended to place a protective barrier of netting impregnated with insecticide around the windows (at a distance of 1.5 to 2 metres from them) in order to facilitate ventilation while at the same time making direct access by *Culicoides* more difficult.
-

REQUIREMENTS FOR REGISTERING QUARANTINE CENTRES AND AUTHORIZING QUARANTINE FACILITIES

1. QUARANTINE CENTRES

Centre for the collection and holding of livestock from one or more farms.
It is an independent holding and must apply to be REGISTERED as such.

Requirements:

- must be separate from and independent of any other livestock holding,
- must have an appropriate perimeter enclosure so that it forms a discrete holding,
- must have premises with doors and windows protected by mosquito nets and curtains with mesh aperture sides of up to five millimetres. The doors and windows must be regularly impregnated with commercially authorised insecticides or repellents depending on the active period of the active ingredient contained in the product used,
- there must be a sufficient number of drinking and feeding troughs available for the animals in conditions suitable for ensuring the welfare of the animals,
- the facilities must be adequately illuminated and ventilated,
- the walls and floors must be easy to clean and disinfect,
- there must be an isolation area or section,
- there must be a crush pen for the performance of the relevant diagnostic tests.
- The crush pen must be located within the actual facilities or, exceptionally, very close to them, so that it is possible to move the animals, check them and pen them as quickly as possible with a veterinarian always being present, and at certain times of the day when the vector is not present.
- there must be a deep pit with waterproof flooring,
- the animal accommodation capacity must be based on the standards for ensuring animal welfare for these purposes (minimum estimate: 3 m² for calves of 180-220 kg to 5 m² for calves of 400 kg. Sheep and goats: 1 m²).

Procedure for registration with the Animal Health Service:

Complete and submit application form.

Attach the following documentation:

1. Certified copy of tax identification number (NIF), national identity card (DNI) or tax identity card (CIF) (in the case of companies and partnerships).
2. Certified copy of the power of attorney granted to one holder, company or legal person if not the applicant.
3. Copy of land register entry for the establishment (indicating the constituent parcels or plots) and copy of the geographical data for the plot(s) from SIGPAC (geographical information system for plots of agricultural land).
4. Certified contract of the lease, deed of sale or title deed (as appropriate, if the applicant is not the person shown in the land register).
5. TECHNICAL REPORT, including:
 - plan or sketch map of the location and area of the Centre.
 - description of the construction, facilities, machinery and tooling.
 - plan of the facilities.

If assistance is being requested, the technical report or design must be evaluated by a competent technician and adjusted in line with the requirements set out in Decree 156/2005.

6. HEALTH REPORT (signed by the veterinarian responsible in the Technical Department).
 - description of the purpose of the centre, including the type of livestock to be processed and the public or private use to be made of it.
 - operating schedule at the Centre: entry and departure of the animals, type of animals, depopulation, etc.
 - schedule of animal health and welfare measures for the livestock being held.
 - disinfection and rat and insect control measures with detailed description of cleaning periods, disinfection guidelines and products to be used.
 - details of the veterinarian responsible in the technical department: name, address, telephone number, professional number, etc.

When the Animal Health Service has checked the documentation, it will carry out an inspection and draw up a report indicating whether or not the centre has passed the inspection. Once the centre has been entered in the Register of Holdings, the registration number will be passed on to the interested party so that the Quarantine Centre in question can commence operation.

2. QUARANTINE FACILITIES

Centre intended to hold livestock from the same breeding farm at which it is already kept.

No need for an entry to be made in the Register of Holdings, as the Registration Number of the farm at which it is kept is sufficient.

The Animal Health Service must grant AUTHORISATION.

Requirements:

- the facility must be separate from any other facilities at the farm and will naturally be within the perimeter enclosure of the actual farm.
- premises with doors and windows protected by mosquito nets and curtains, with mesh aperture sides of up to five millimetres. The doors and windows must be regularly impregnated with commercially authorised insecticides or repellents depending on the active period of the active ingredient contained in the product used,
- there must be a sufficient number of drinking and feeding troughs available for the animals in conditions suitable for ensuring the welfare of the animals,
- there must be sufficient water available for consumption by the animals and to clean the facilities,
- the facilities must be adequately illuminated and ventilated,
- the walls and floors must be easy to clean and disinfect,
- there must be an isolation area or section
- there must be a crush pen for the performance of the relevant diagnostic tests, which must be located within the actual facilities so that it is possible to move the animals and check them with a veterinarian always being present, as quickly as possible.
- there must be a deep pit with waterproof flooring if assistance is being requested,
- the animal accommodation capacity must be based on the standards for ensuring animal welfare for these purposes (minimum estimate: 3 m² for calves of 180-220 kg to 5 m² for calves of 400 kg. Sheep and goats: 1 m²).

Procedure for authorisation by the Animal Health Service:

- Complete and submit application form.
- Attach the following documentation:
- Full technical report, including:
 - plan or sketch map of the location and area of the Centre.
 - description of the construction, facilities, machinery and tooling.
 - plan of the facilities.

Bluetongue: Protection From Vector Attack

Introduction

1. Animals are permitted to move out of a Bluetongue Protection Zone or Surveillance Zone if they fulfil at least one of the conditions set out in Annex III of the Commission Regulation (EC) No. 1266/2007. Some of these conditions allow movements of animals that have been protected from vector attack:

- Animals must be protected against vector attack for at least 60 days before movement. Or:
- Animals must be protected against vector attack for at least 28 days before movement; negative results from a serological test performed at least 28 days after the start of protection. Or:
- Animals must be protected against vector attack for at least 14 days before movement; negative results from a test for virus carried out at least 14 days after protection started.

In order to meet the condition of protection against vector attack, animals must be kept in vector-proof accommodation for the entire period of protection. While insecticide spray is a useful tool for the short-term control of vectors, for example during transport, on its own it cannot provide effective protection from vector attack over the longer periods required as a condition for an exit ban exemption.

2. This leaflet sets out the requirements for vector-proof accommodation that **must be fulfilled** in order to move animals out of bluetongue Restricted Zones in Scotland under the Annex III conditions listed above. Similar requirements are in place for movements out of Zones in England and Wales. These requirements involve significant investment in adaptations to livestock buildings and in the ongoing management of livestock kept within midge-proof accommodation. It is therefore suggested that the construction and use of such accommodation is only likely to be worthwhile for very high value livestock for which other means of exiting the restriction zone (i.e. vaccination, natural immunity or movement during a vector free period) are not an option.

Construction of a vector-proof facility

3. A vector proof unit must:

- Be a compartment within a building or container
- Have no gaps in the construction greater than 1 mm in width.
- Be sufficiently robust that the animals to be quarantined are not able to cause damage that would create a breach of protection from vectors.
- Provide enough space, light, ventilation and other features necessary to safeguard the welfare of the animals throughout the quarantine period.
- Have all openings protected by filters or mesh impregnated with insecticide and with a maximum mesh size no greater than 1.6mm².
- Have a double door entry system whereby at least one of the doors (inner or outer) is closed at all times.
- Contain at least two working ultraviolet insect traps.

4. Where possible the facility should be located away from animal housing and yards that are likely midge breeding sites. The area surrounding the animal accommodation must be kept as free of manure to minimize the likelihood of midges accidentally entering the building trapped on person and in feed etc.

Note: An open-sided barn is unlikely to be adequate. A disused refrigerated vehicle body or a shipping container may be suitable for smaller animals. Openings for light and ventilation must be provided, including fan ventilation if necessary.

Openings

5. The filter or mesh used to cover openings must be soaked or sprayed with synthetic pyrethroid insecticide before the facility is put into use and at intervals of no more than 30 days thereafter or in accordance with the manufacturer's instructions if they specify a shorter interval.

Note: Suitable insecticides would be those approved for the treatment of buildings (see below).

Entry system

6. Each door of the double-door entry system must be fitted so that there is a gap around it of no more than 1mm, or be otherwise constructed to prevent midges getting through (e.g. draught proofing foam strips impregnated with insecticide). The space between the doors must be large enough to accommodate any person, animal or object likely to enter or leave the facility during the period of protection from vector attack to enable either the inner or the outer door to be closed at all times.

Note: In order to minimise traffic through the entrance, piped drinking water must be provided and enough feed and bedding should be stored within the vector proof unit to supply the animals through the complete protection from vector attack period. If possible, storage for manure should also be provided within the facility.

Insect traps

7. At least one ultraviolet insect trap must be positioned in the space between the double entry doors, placed no higher than at head height. At least one further trap must be positioned in the animal holding room. Both traps must be operational at all times during the protection from vector attack period.

Note: Ultraviolet insect traps must be turned on prior to the animals entering the animal holding room and must be checked regularly for dead insects to ensure that the protection is working. A period of darkness is required for effective trap operation.

Management of a vector proof facility

Preparation

8. Before animals are placed in the facility, it must be cleansed and disinfected and treated with insecticide, paying particular attention to cracks or joints in the construction where midges may enter. It must be checked carefully to ensure that it remains sealed and that any apertures remain covered with mesh that is in a good state of repair and regularly treated with insecticide.

9. The animals must be treated with insecticide before they are introduced to the facility. The period of protection from vectors begins when the last animal enters the facility.

Livestock Management

10. The animals must be checked daily for signs of disease. Any signs of bluetongue or other notifiable disease must be reported immediately to the local Animal Health Divisional Veterinary Manager.

11. Movement of people and objects into and out of the facility should be kept to a minimum. When entering the facility, the outer door must be closed, clothing brushed down, and the person should wait for 1 minute, standing near to the ultraviolet trap before opening the inner door. On leaving the facility the inner door must be closed before opening the outer one. Both doors should remain securely closed at all other times. The outer door should be protected against unauthorised access through the use of a

warning notice or a lock or both. The need to evacuate people and animals in the event of an emergency must be considered.

Note: Normally a single person plus a deputy should be nominated to care for the animals. There is no need to avoid contact with non-protected animals but a normal standard of biosecurity should be practised depending on the health status of the livestock.

12. If an animal is removed from the unit for any reason, it may not re-enter or be replaced with an alternative animal without restarting the full period of protection required. When moving an animal, precautions must be taken to avoid the entry of midges, for example through the spraying of insecticide and minimising the time that the outer door is open or through moving the animal when the temperature is below 5°C or during the middle of the day when vector activity is reduced.

Note: It is unlikely that lactating animals could be successfully protected unless they can be milked or suckled within the facility.

Record keeping

13. Each occasion when insecticide or any other veterinary treatment, including testing, is undertaken must be recorded in accordance with normal statutory requirements.

14. The date and time when each animal is added to or removed from the vector proof unit must be recorded and it must be clearly stated when the protection from vector period began. Animals must be identified as required by the relevant legislation.

General Information

15. Official veterinary certification is necessary for animals consigned to another country. Contact your local DVM for more details on export requirements.

16. It may be easier to maintain a high level of protection from vector attack if the period of protection is shorter. It is therefore advisable to consider moving animals under one of the Annex III conditions that requires 14 or 28 days protection in combination with testing.

17. Where sourcing livestock from high-risk areas is unavoidable, it is the responsibility of the buyer to ensure that whatever the movement conditions are, they have been met by the vendor that they intend to purchase from.

Guidance on insecticide treatment

18. Insecticides must be used in accordance with manufacturer's instructions. Spraying at rates beyond the manufacturer's instructions will not improve efficacy, but will increase the risk of groundwater and surface water pollution, with environmental consequences.

Livestock

19. Only insecticides with appropriate marketing authorisations may be used on animals. They must be used in accordance with the manufacturer's instructions, including the interval between repeat treatments. The most commonly used active ingredient/formulation available is a synthetic pyrethroid pour-on.

Buildings

20. When required as described above, the space and surfaces inside of the quarantine facility animal compartment must be treated with a residual insecticide spray licensed by the Health and Safety Executive