

## CHAPTER 17

# CREATION OF CONTROL ZONES, CENSUS AND SURVEILLANCE

## INTRODUCTION

This chapter describes the steps involved in the creation of zones, the compiling of the census and the implementation of a surveillance programme – including the steps necessary at the end of an outbreak for lifting the restrictions. It also defines an epidemiological unit of animals, on which the surveillance programme is based.

For movement control measures required within a control zones see Chapter 14, **Controls following confirmation of disease**.

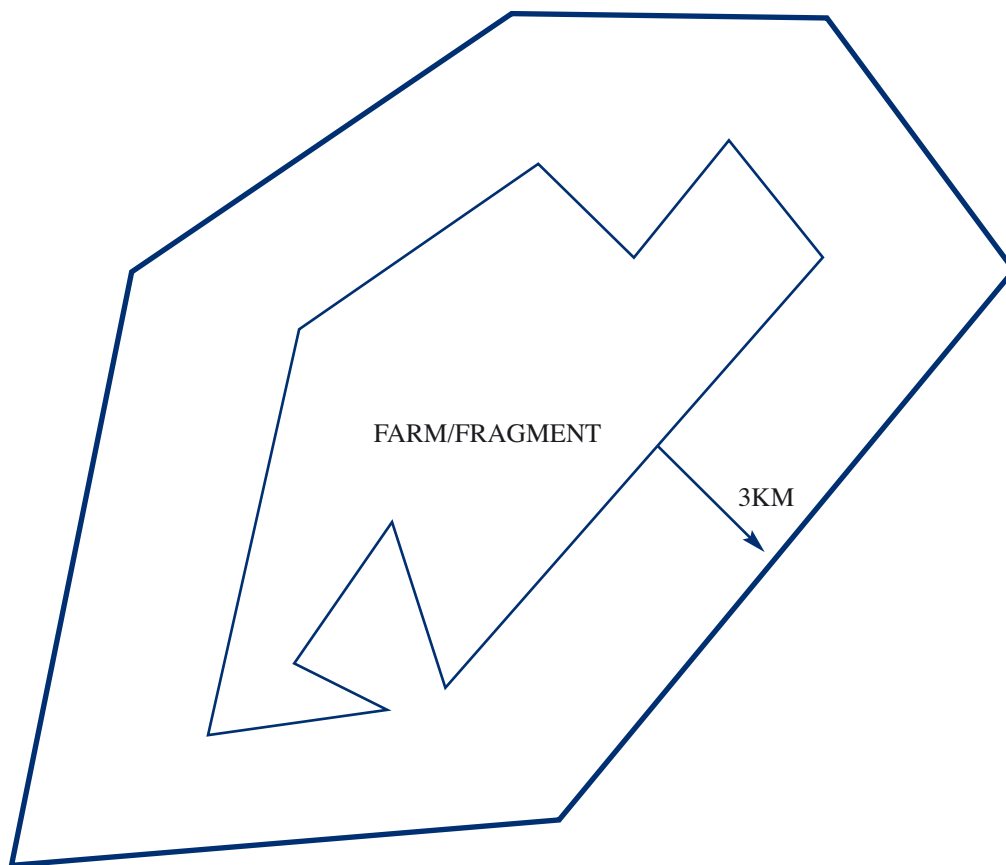
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## 1. ESTABLISHING THE PROTECTION AND SURVEILLANCE ZONES

- 1.1 Article 9 of Directive 85/511/EEC, as amended by 90/423/EEC, requires that a Protection zone (PZ) of at least 3km and a Surveillance zone (SZ) of 10 km be established around an infected holding.
- 1.2 The legal basis for establishing infected areas (Protection Zones) and controlled areas (Surveillance Zones) in national law is in Articles 28 and 41 of the FMD Order, 1956.
- 1.3 The EU Directive also requires that ‘the definition of the zones shall take account of natural boundaries, supervision facilities and technological progress which make it possible to foresee the possible dispersion of virus by air or any other means and will have to be reviewed, if necessary, in the light of such elements’.
- 1.4 **The PZ should always be extended** to natural boundaries, such as roads, rivers, mountains, **never reduced**. In exceptional circumstances (e.g. where wind borne spread is considered likely or commonage is present) and only on foot of epidemiological advice, the PZ may have to be extended significantly.
- 1.5 Where the natural boundary is close (100 – 200 metres) to the edge of the PZ, it makes sense to use it to define the zone. But the PZ should be no larger than is absolutely necessary because any increase in the size results in a significant increase in the workload of the surveillance programme.
- 1.6 The PZ will be drawn from the outermost edges of all fields in the infected farm fragment, not from a central point within the holding. This will apply in all cases except those in which all animals have been housed for at least 21 days prior to the reporting of the index case. In such a case the zone will be drawn based on a point at the centre of the farm buildings.
- 1.7 At the edges of the zone, where fragments straddle the perimeter, include all fragments of which any part lies within the zone. This has the effect of changing the shape of the zone into a zig-zag pattern (see **Figures 1 & 2** below).
- 1.8 Exclude fragments if you are satisfied, based on local knowledge, that the fields and farm buildings that lie within the zone have not been populated with susceptible species for at least 21 days prior to the reporting of the index case. Fragments can also be excluded if the specific epidemiological circumstances warrant it.
- 1.9 The SZ is established using the same methods as the PZ, as described in **Sections 1.4 – 1.6** above. In addition, natural or man-made geographical features, such as rivers, roads mountains etc., will be taken into account to extend the zone to the most logical configuration based on epidemiological principles.

- 1.10** In most cases a **1Km zone** will be established, using similar methodology to that used for PZ and SZ, to identify the area in which a cull might take place. As this is the most critical area based on contiguity to the infected farm, **farm visits will be required to validate the fields/fragments in this zone**. It is critical that every fragment/building that contains susceptible species is accounted for. The officer must also determine the identity and use of unmarked pieces of land in the Land Parcel Identification System (LPIS) map.
- 1.11** The limits of the zones will be described in legislation by reference to road numbers and direction e.g. South East on N7 to junction with N4.



*Figure 1. Example of farm/fragment outline and the 3Km Zone*

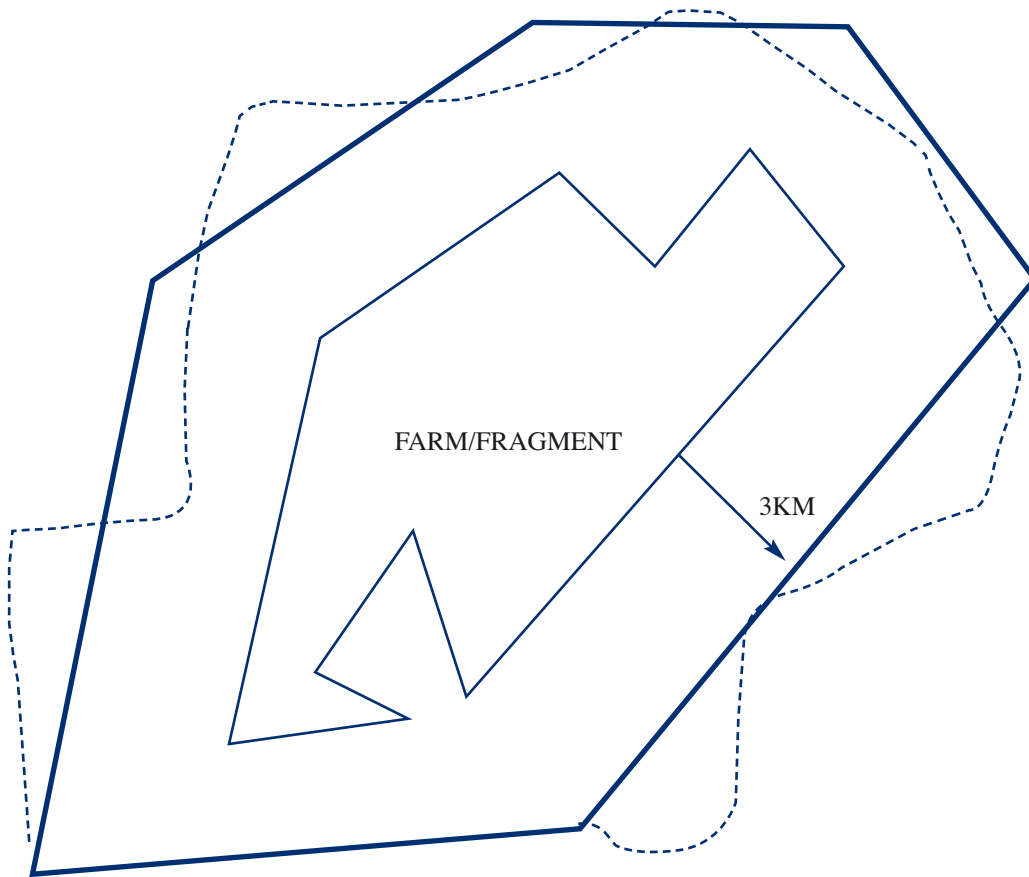


Figure 2. The modification of the edge of the 3 Km zone to take account of fragments that should be included and others that can be excluded based on epidemiological grounds.

**Key to Figure 1 & 2**

- Farm Boundary
- 3Km Boundary
- - - - - Adjusted 3Km zone

## 2. CENSUS

- 2.1 Article 9 of 85/511/EEC as amended by 90/423/EEC requires that a census is taken on all holdings in both the PZ and the SZ to establish the numbers of:
- animals of each susceptible species at risk in each zone
  - farms, so that assessments of the requirements for staff (numbers and experience) and sampling equipment can be made
  - animals on each farm, so that illegal movement can be prevented.
- 2.2 An **initial census** of the number of holdings and the number of animals of each susceptible species will be required **as soon as possible**, as part of the report required for presentation to the Standing Committee of the Food Chain and Animal Health (SCoFAH). The initial estimates may be taken from existing databases – AHCS (cattle), NSIS (sheep) and NPITS (pigs).
- 2.3 It is extremely important that the **final census** to be entered on the FMD database is accurate. Errors of any kind can have serious consequences should the herd be slaughtered at a later stage. This census will require a field visit by a VI or TAO to establish the presence or absence of susceptible species on all premises listed on existing databases. In addition, field visits should identify any additional livestock holdings that may not have been captured on the existing databases e.g. holdings with pet animals or sheep holdings on which premia are not claimed. **It is essential to use staff with local knowledge for these visits.**
- 2.4 It is important to count, categorise and locate all of the animals. Each animal species must be subdivided into the different types e.g. cow, calf, store, heifer, bull etc. and that the numbers of each type and each species recorded for each fragment. (See **Figure 3** below) In addition, fragments will be given a value to indicate the zone in which they are located. The census recorded should be signed by the farmer or farm agent.

Figure 3

FRAGMENT ADDRESS NUMBER	ZONE	CATTLE	SHEEP	PIGS	GOATS	DEER
00 (Home)		Cows Bulls Heifers Stores Calves	Ewes Rams, Hoggetts Lambs	Sows Boars Piglets Weaners Fatteners	Adults Weaners Kids	Does Bucks Weaners Calves
01		Cows Bulls Heifers Stores Calves	Ewes Rams, Hoggetts Lambs	Sows Boars Piglets Weaners Fatteners	Adults Weaners Kids	Does Bucks Weaners Calves
02		Cows Bulls Heifers Stores Calves	Ewes Rams, Hoggetts Lambs	Sows Boars Piglets Weaners Fatteners	Adults Weaners Kids	Does Bucks Weaners Calves

### 3. MANAGEMENT OF SURVEILLANCE TEAMS AT THE LDCC

Surveillance is defined in the Directive as “A systematic programme of investigation designed to establish the presence, extent or absence of FMD. It includes checking for clinical signs and sampling for viral antibodies.”

- 3.1** Article 9 of Directive 85/511/EEC as amended by 90/423/EEC requires that periodic veterinary inspections be carried out on herds in the PZ (see **Section 3.16** for frequency of inspections).
- 3.2** Article 37 of the draft Commission proposal to amend Directive 85/511/EEC [Document COM (2002) 736 final] also proposes that periodic inspections must be carried out in the SZ.
- 3.3** On arrival at the LDCC, field staff will report to Personnel Section (see Chapter 13, **Local Disease Control Centre**) which will record name, address, mobile phone no. and proposed date of departure. Field staff will be issued with a pass which will enable them to pass through Garda checkpoints. The pass can also be used to have car-wash services available on account. New staff should then be given an introductory briefing on:
- a) the symptoms of FMD
  - b) protocol for inspection/examination
  - c) procedure to deal with and report suspects
  - d) biosecurity (personal, equipment and car)
  - e) maps and map-reading
  - f) summary of disease situation in the area
  - g) the definition of an epidemiological unit (see **Section 4** below)
  - h) accurate census recording
  - i) animal welfare considerations



- 3.4** A daily morning briefing should also be held for all field staff covering:
- an update on the previous days developments
  - any new/modified instructions regarding the surveillance programme
  - feed-back from the field officers regarding any problems encountered
  - regular reminders of “the importance of finding the disease and not spreading it”
- 3.5** The Epidemiology Section will be involved in the definition of the zone. When this has been decided, the Surveillance Team will allocate herds for visiting. Administratively, the work will be listed by the Surveillance Section (for details see Chapter 13, **Local Disease Control Centre**).
- 3.6** Clear written instructions for the work to be done on all visits should be given to the field teams. Any requirements regarding sampling/examination should also be included in the instruction. Any information which may be of use to the visiting vet should be included, such as herdowner’s phone number, known stock numbers, associated herds, location of stock etc.
- 3.7** General surveillance inspections will involve an initial visual **inspection** of all animals followed by a detailed **examination** of ‘High Risk’ animals e.g. any animal that is sick, lame, salivating or showing any other signs of being unwell. Animals that are lying should be made to stand up for the purpose of the inspection.
- 3.8** The farmer should be advised of relevant signs to watch for while herding his animals and given any literature considered appropriate (see FMD Advice leaflet 1 in Chapter 28, Advice leaflets, posters and signs). He or she should be made aware of the necessary biosecurity measures to prevent the spread of the disease. In addition, he or she should be advised to report any suspicious findings to the LDCC Surveillance Section (or directly to the visiting vet). He or she should be given the phone number(s) of the LDCC and the mobile phone no. of the visiting vet.
- 3.9** Surveillance teams should carry sufficient appropriate, up-to-date surveillance inspection forms, census forms (if different), maps, protective clothing, disinfectant, blood testing kits etc. Tissue samples are normally taken by ROs, but in a Class A outbreak it may be appropriate for VIs to also carry tissue sampling kits.
- 3.10** After a visit all the paperwork should be returned immediately to the Surveillance Section for processing. This must be checked for legibility and completeness at the point of handing over. The report should also be checked before it is processed for any follow-up action that may be required. It is advisable that a VI is present at this debriefing.
- 3.11** The file should be processed similarly to any herd file under the Disease Eradication Programmes. During the processing of the file, census and sampling data are recorded. Other relevant information, such as associated herds, handling facilities on farm, suitable times of inspection etc., should be recorded. The herd should then be scheduled for its next visit and the file closed. Any problems highlighted should be reported to the officer in charge of the Surveillance Section.

- 3.12** If a herd is visited a number of times as part of the surveillance programme it is preferable that the same team carry out all the visits. This allows the vet to become familiar with the farmer, the stock, the terrain etc. The farmer will also benefit from this arrangement as he or she will have a contact party if there is a need for further advice.
- 3.13** The veterinary teams will be confined to a small number of herds in the same geographical area. If FMD is discovered in one of these herds, therefore, the number of herds at risk of spread by the vet will be contained. Fragmented holdings may present difficulties, and the surveillance team leader will advise field staff how these should be dealt with.
- 3.14** Recording the time taken to complete the first visit will be useful when scheduling subsequent visits (NB. The first visit will almost certainly take longer than subsequent visits).
- 3.15** Staff who have been in contact with positive or highly suspicious cases should be regarded as contaminated and should avoid contact with susceptible animals for at least **3 days**, or as directed by NDCC. Such staff should be allocated work on IPs or office duties.
- 3.16** Decisions on the frequency of surveillance visits will be influenced by the disease scenario, availability of staff and the risks of spreading disease. The frequency will be decided by the National Expert Epidemiology Group. If possible herds should be visited:
- every 48 hours in week 1
  - every 72 hours in week 2
  - on day 21.
- 3.17** When herds/flocks are visited as part of the zone clearance programme (see **Annex 1**), the Directive requires that animals are **examined**, whereas during the periodic veterinary inspections the requirement is for animals to be **inspected**. NDCC/Epidemiology Section will give instructions on the extent of examination.
- 3.18** Surveillance visits can be categorised into:
- Census
  - Census + Clinical (+ Sampling)
  - Suspect
  - Tracing/Contact
  - Pre- slaughter clinical
  - Zone clearance.

## 4. DEFINITION OF AN EPIDEMIOLOGICAL UNIT OF ANIMALS

- 4.1 The concept of an ‘Epidemiological Unit’ **must** be understood by all field staff. This is especially important if the sampling programme is to be effective and particularly prior to the lifting of restrictions in the zone. Sheep and goats must be sampled according to the statistical regime of ‘95/5’ – the number of samples to be taken from a group to detect a 5% prevalence with 95% confidence. A statistical table is provided for reference in **Annex 2**.
- 4.2 Serious sampling errors will occur if a number of groups are wrongly regarded as comprising one epidemiological unit.

GROUP SIZE	NO. OF SAMPLES REQUIRED FOR 95/5
100	45
200	51

If two groups comprising 100 animals in each are regarded as one epidemiological unit of 200 animals, the number of samples (51) would be significantly less than if the two groups were sampled separately (90). This could result in failure to identify disease and must be guarded against.

- 4.3 The field officer is required to evaluate the groups of animals and how they have been managed in the recent past in order to determine the number of epidemiological units they constitute. The more groups identified, the greater the number of samples that will be necessary.
- 4.4 If the field officer is looking at two groups of animals and wonders whether they should be regarded as one or two epidemiological units, he/she should pose this question: “Could disease possibly have entered one of these groups and not spread to the other?” If the answer is “Yes” the groups must be treated separately. The simple rule is: **unless there is actual or probable nose-nose contact, treat as separate epidemiological units.**
- 4.5 Fragments of the holding do not necessarily define epidemiological units. Two fragments can easily comprise one epidemiological unit. For example, if animals on both fragments were only separated immediately prior to the time of sampling they can be treated as one epidemiological unit for the purpose of zone clearance sampling.

## ANNEX 1 - ZONE CLEARANCE PROTOCOL

## (ANNEX III OF COM (2002) 736 FINAL)

	SHEEP & GOATS	OTHER SUSCEPTIBLE SPECIES
<b>P ZONE</b>		
<b>CLINICAL EXAMINATION</b>	All animals, all holdings	All animals, all holdings
<b>SPECIAL EMPHASIS</b>	Holdings with possible contacts to IP	Holdings with possible contacts to IP
<b>RECORDS</b>	Examination of records: <ul style="list-style-type: none"> <li>• sickness</li> <li>• mortalities</li> <li>• abortions</li> <li>• feed intake</li> <li>• production</li> <li>• purchase/sales</li> <li>• visits from people likely to transmit disease</li> </ul>	Examination of records: <ul style="list-style-type: none"> <li>• sickness</li> <li>• mortalities</li> <li>• abortions</li> <li>• feed intake</li> <li>• production</li> <li>• purchase/sales</li> <li>• visits from people likely to transmit disease</li> </ul>
<b>SEROLOGY</b>	<ul style="list-style-type: none"> <li>• All holdings</li> <li>• 95/5 animals within the holding – see <b>Annex 2</b></li> <li>• From <b>21</b> days after slaughter &amp; preliminary C &amp; D of last IP</li> </ul>	If recommended by Epidemiology Team
<b>DEROGATION</b>	Serology not required for sheep/goats which have been in direct contact with cattle for the past 21 days	

	<b>SHEEP &amp; GOATS</b>	<b>OTHER SUSCEPTIBLE SPECIES</b>
<b>S ZONE</b>		
<b>CLINICAL EXAMINATION</b>	All animals, all holdings	All animals, all holdings
<b>SPECIAL EMPHASIS</b>	Holdings with possible contacts to IP	Holdings with possible contacts to IP
<b>RECORDS</b>	Examination of records: <ul style="list-style-type: none"> <li>• sickness</li> <li>• mortalities</li> <li>• abortions</li> <li>• feed intake</li> <li>• production</li> <li>• purchase/sales</li> <li>• visits from people likely to transmit disease</li> </ul>	Examination of records: <ul style="list-style-type: none"> <li>• sickness</li> <li>• mortalities</li> <li>• abortions</li> <li>• feed intake</li> <li>• production</li> <li>• purchase/sales</li> <li>• visits from people likely to transmit disease</li> </ul>
<b>SEROLOGY</b>	<ul style="list-style-type: none"> <li>• <b>95/2</b> holdings (max 150) within zone - representing all administrative units (DEDs) in zone</li> <li>• <b>95/5</b> animals within the holding – see <b>Annex 2</b></li> <li>• From <b>21</b> days after slaughter &amp; preliminary C &amp; D of last IP</li> </ul>	If recommended by Epidemiology Team
<b>DEROGATION</b>	Serology not required for sheep/goats which have been in direct contact with cattle for the past <b>30</b> days	

## ANNEX 2

## 95/5 SAMPLING RATES

SIZE OF EPIDEMIOLOGICAL UNIT	NO OF SAMPLES REQUIRED TO DETECT 5% PREVALENCE OF DISEASE WITH 95% CONFIDENCE
10	EACH ANIMAL
20	19
30	26
40	31
50	35
60	38
70	40
80	42
90	43
100	45
120	47
140	48
160	49
180	50
200	51
250	53
300	54
350	54
400	55
450	55
500	56
600	56
700	57
800	57
900	57
1000	57
1200	57
1400	58
1600	58