



G. VARDANYAN

Clinical signs of ASF in a pig on a commercial farm, Tavush Marz, Armenia

African swine fever (ASF) in the Caucasus

Outbreaks of ASF were reported in the Caucasus region for the first time in 2007–2008, and are likely to spread further to eastern Europe or other areas where swine are raised. If not contained, ASF could easily spread to other countries in the region and would have a protracted direct effect on the productivity of the livestock industry, and an indirect effect on the food supply and thus food security. There is no vaccine for the prevention of ASF (page 7).

Foot-and-mouth disease (FMD): FAO Reference Laboratory Contract Report (January–June 2008)

There were no outbreaks officially reported in FMD-free countries that did not practise vaccination between January and June 2008. From January to June 2008 FMD outbreaks have been reported in Africa, the Near East and South America (page 13).

AND...

H5N1 HPAI Outbreak in Turkey in 2008 (page 2).

Capacity building: Geographical Information Systems (GIS) applied to the surveillance and modelling of transboundary animal diseases (TADs) in China (page 23).

GREP regional meeting on official recognition of freedom from rinderpest for the Near East (page 25).

News (page 28).

Contributions from FAO Reference Centers (page 33).

Stop the press as of October 2008 (page 35).

FAO-EMPRES in action

In order to enhance epidemiological knowledge in Africa, and to further explore the behaviour of the highly pathogenic avian influenza (HPAI) epidemic in the continent, an extensive survey entitled EPIAAF (Epidemiology of Avian Influenza in Africa) was launched by FAO in November 2007. The aim is to assess risk factors linked to the introduction, diffusion and persistence of HPAI (page 20).



E. LETTER

Domestic poultry sampling to assess animal health status, Niger

Need to ship samples for confirmation? EMPRES can assist in the shipment of samples for transboundary animal diseases (TADs) diagnostic testing at an OIE/FAO reference laboratory and reference centres. Please contact empres-shipping-service@fao.org for information prior to sampling or shipment. Please note that sending samples out of a country requires export permit from the Chief Veterinary's Office of the country and one import permit from the receiving country. It is not as easy as one may think.



S. NEWMAN

Mainly Coot (*Fulica atra*)
Wigeon (*Anas penelope*)
Shoveller (*Anas clypeata*),
Turkey

Highly pathogenic avian influenza

H5N1 HPAI Outbreak in Turkey in 2008

Introduction and background

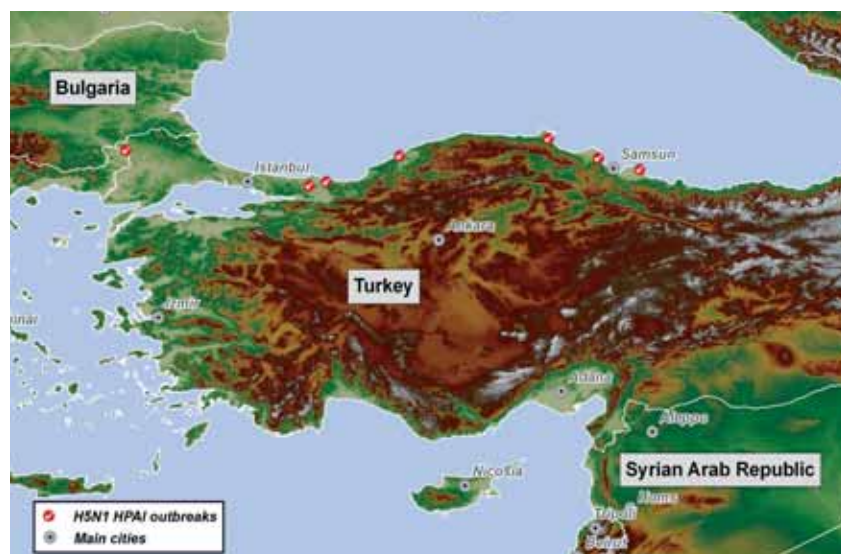
During the last three years, Turkey has experienced outbreaks of highly pathogenic avian influenza (HPAI) caused by H5N1 each year, usually commencing during the winter. In 2005–2006, there was a large outbreak which led to more than 200 cases spread over most of the northern country and in 2007 there was a smaller outbreak of less than 20 cases in the south-east of the country. In both situations, wild birds were suspected as the initial source of introduction and further spread in domestic poultry.

There were two outbreaks in small-scale, village-based commercial poultry; no cases occurred in large-scale commercial poultry. This article discusses the suspected role of wild waterbirds in the outbreaks of 2008.

Description of the 2008 outbreak

There was a series of seven outbreaks of HPAI confirmed as due to the H5N1 strain in Turkey between January and March 2008. These outbreaks were investigated jointly by the Government of Turkey, FAO's Animal Health Service (AGAH) staff and the European Union avian influenza project team. Figure 1 below shows the locations of the outbreaks in domestic poultry.

Figure 1: Geographical location of H5N1 HPAI outbreaks in domestic poultry in Turkey in early 2008



L. DE SIMONE



Outbreaks of H5N1 HPAI occurred in five provinces, all of which border the Black Sea. They were spread over about 900 km from East to West, and the distances between outbreaks were large (minimum, median and maximum distance between outbreaks were 31, 116 and 317 km respectively). All the outbreaks were relatively close to the coast (min.: 2 km, med.: 5 km and max.: 29 km) and all outbreaks were close to an inland water body on which wild waterbird populations were present and hunted (distance to water body: min.: 0.1 km, med.: 1 km and max.: 9 km).

The duration of the epidemic from the date of the first signs to the end of the last cull was around 60 days. Figure 2 shows the epidemic curves for the outbreak as seven day retrospective totals for onset and report of outbreaks, and a seven day retrospective rolling average of numbers of outbreaks from which the virus was potentially being shed. The highest number of outbreaks commencing with clinical signs, or reported to veterinary authorities in a seven day period and shedding virus on a single day, was three. This factor, the overall pattern of the curves and the geographical spread of the outbreaks, indicates a series of introductions rather than an epidemic propagated by spread from outbreaks to create secondary outbreaks.

Affected households in the village of Konacik, Sakarya Province, Turkey



S. NEWMAN

Outbreak investigation

The Mission team conducted outbreak investigations [with the European Union (EU) team] and wild bird censuses including transects and point counts (with national ornithologists) at five of six outbreak sites (Yörükler and Aybeder in Samsun Province, Yenican and Konacik in Sakarya Province and Tasmanli in Sinop Province). The initial

Figure 2: Epidemic curve of the H5N1 HPAI outbreak in Turkey during early 2008

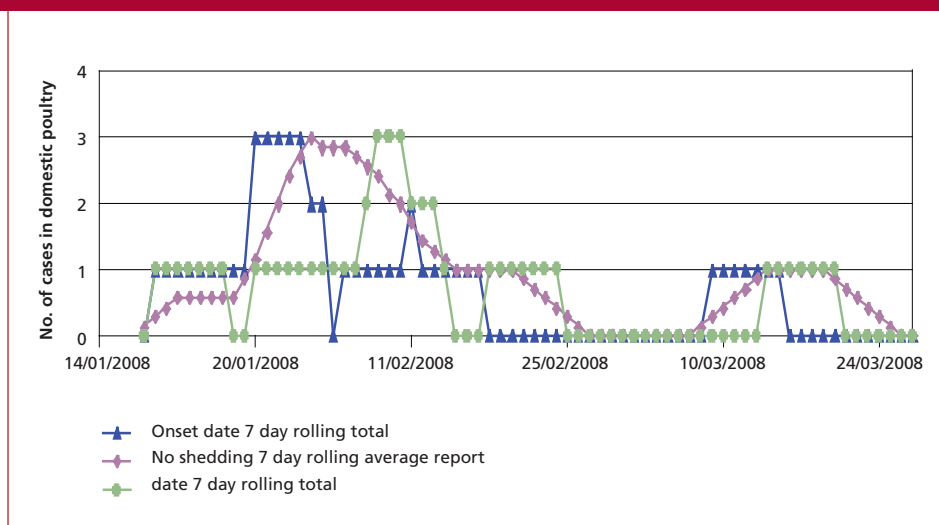




Table 1: Summary of the findings from outbreak investigations of H5N1 HPAI outbreaks in Turkey in early 2008

Outbreak code	08001	08002	08003	08004	08005	08006	08007
Village	Sazkoy	Yorukler	Yenicam	Konacik	Aybeder	Tasmanli	Esitce
Province	Zonguldak	Samsun	Sakarya	Sakarya	Samsun	Sinop	Erdine
Date of onset clinical signs	19/01/2008	26/01/2008	28/01/2008	28/01/2008	05/02/2008	11/02/2008	09/03/2008
Date reported	19/01/2008	28/01/2008	04/02/2008	07/02/2008	07/02/2008	18/02/2008	14/03/2008
Days from onset to report	1	3	7	10	3	8	6
Date culling finished	22/01/2008	02/02/2008	05/02/2008	09/02/2008	08/02/2008	20/02/2008	19/03/2008
Days from report to end of cull	3	5	1	2	1	2	5
Culled on basis of	Rapid test	rRT-PCR	Rapid test	Rapid test	Rapid test	Rapid test	rRT-PCR
Contact with other outbreak sites	N	N	N	N	N	N	N
Live birds brought to village	N	N	N	N	N	N	N
Domestic ducks or geese in village	Y	N	Y	N	Y	N	Y
Domestic ducks or geese in affected flocks	N	N	Y	N	Y	N	N
Contact with markets	N	N	N	N	Y	N	N
Movement of villagers to outbreak sites	?	N	N	N	N	N	N
Poultry products bought by villagers	?	?	Y	Y	Y	N	?
Traders, milk lorry etc. visited village	Y	N	Y	Y	Y	?	Y
Poultry farms within 3km of village	N	N	Y	N	N	N	N
Poultry farm workers, vet staff, agric staff live in village	N	Y	N	N	N	N	N
Village on vehicle through-route	N	N	N	N	N	N	N
Regular vehicle traffic past outbreak site	N	N	N	N	N	N	N
Direct contact with wild waterbirds	N	Y	N	N	N	N	N
Contact with "bridging species" ¹	Y	Y	Y	Y	Y	Y	Y
Direct contact with remains of hunted birds	Y	?	Y	Y	Y	?	Y

Legend: N=No; Y=Yes; ?=Unknown

¹ Several bird groups that utilize both wetland and human-altered habitats, making them species likely to come into contact with both domestic and wild bird species.



outbreak at Sazkoy in Zonguldak Province was not evaluated directly by the Mission team, as it had been fully investigated previously and had occurred well before the Mission was mobilised. A seventh outbreak was reported in Esitice (Erdine) after the CMC Mission had been completed.

The first step of the analysis was to look for domestic poultry sources of infection. Only one of the outbreaks was close to a commercial poultry farm and none had direct links to a commercial farm through personnel, equipment or vehicles. No outbreak was found on through-routes, or near areas of regular road traffic. Although traders, milk lorries and other vehicles visit most of the affected villages on a regular basis, the distance observed between the outbreaks makes it unlikely that they were instrumental in spreading the infection. It was confirmed during investigations that there were no such links between outbreak sites. Contact with markets was recorded for one of the outbreaks, but the absence of any other disease occurrence in the locality made this a very unlikely source. Poultry products, in particular chilled and frozen meat, were bought in several cases from commercial shops in many of the villages, but again, the lack of any other local cases makes this an improbable source of infection.

Domestic ducks and geese were reported in four of the villages and in two of the affected flocks. There is no evidence of spread between outbreak sites by the movement of domestic ducks or geese. The geographically widespread nature and the relatively short time span of the outbreaks, as well as the absence of ducks and geese from most of the affected flocks, do not support the theory that domestic geese and ducks are a possible source.

In five of the seven outbreaks there was clear evidence of hunted wild birds being brought to the first affected household and of exposure of these flocks to the internal organs and feathers from these birds. In a further outbreak site, the affected flock was in a household on the banks of a channel where many wild waterbirds were present. In one outbreak site, although hunting activities were denied, evidence was found of recent hunting activity at a nearby reservoir.

In summary, definite links exist with waterbirds, but the link is via hunting rather than direct contact with wild waterbirds.

Discussion and conclusion

This epidemic confirms the suspicion that wild birds were the source of the outbreaks. It is notable that in most cases there is strong evidence that the infection was introduced by hunting rather than through direct contact between domestic poultry and wild birds. This adds to and reinforces the premise that in many cases

Poultry keepers providing information about the outbreak in Yenicam, Samsun Province, Turkey



S. NEWMAN

Team on the way to the affected household in Yenicam, Samsun Province, Turkey



N. HONHOLD



S. NEWMAN

Chickens eating Coot
(*Fulica atra*), Turkey

this disease is spread by human activities. The epidemiological investigation reported here shows that even where wild birds are the source of infection in domestic poultry, human behaviour contributes perceptibly to the dissemination of the virus.

The other notable features are that these outbreaks have been detected early and controlled in a way that has prevented further spread. This confirms that it is possible to establish a sensitive passive surveillance system and apply limited but rapid control measures. In several cases, culling has been undertaken on the basis of a combination of clinical signs and the results of rapid testing.



African swine fever

African swine fever in the Caucasus

Introduction

African swine fever (ASF) is caused by a DNA virus, *Asfivirus*, currently the sole member of the Asfarviridae family. It is a highly contagious and virulent virus for domestic pigs, but can also be acquired through the ingestion of contaminated feedstuffs and transmitted by certain tick species. ASF has a serious socio-economic impact on livelihoods, on international trade, and on food security. Feral pigs (escaped domestic species) or European wild boar (non-domesticated species) are equally susceptible to ASF, which makes it very difficult to control the disease if the infection becomes endemic in these populations. Humans are not susceptible to ASF infection.

The disease is endemic in domestic and wild porcine species in most of sub-Saharan Africa and Sardinia (an Italian island in the Mediterranean). Where the infection occurs, pig production is usually sustainable only by adoption of high biosecurity levels on individual holdings.

ASF outbreak in 2007–2008

Outbreaks of ASF were reported in the Caucasus region for the first time in 2007–2008, and are likely to spread further to eastern Europe or other areas where swine are raised (Figure 1).



G. VARDANYAN

Clinical signs of ASF in a pig from a commercial farm, Tavush Marz, Armenia

Figure 1: African swine fever prevalence from June 2007 to January 2008



L. DE SIMONE

Source: EMPRES-i/ GLiPHA

Georgia

Although ASF was not reported to the World Organisation for Animal Health (OIE) until 5 June 2007, the first clinical cases were seen before May 2007 in the area surrounding the port of Poti, on the eastern shore of the Black Sea. All evidence so far indicates that the virus was probably introduced into Georgia by improperly discarded waste from international ships carrying contaminated pig or pig products. Since most pigs in Georgia are traditionally kept in a free range, scavenging system, access to dumped port waste is likely. Afterwards, the disease spread eastwards and north following the main transportation routes. This was the first official report of ASF occurrence in the Caucasus region. Sequence analysis of the Georgian ASF virus isolate revealed a close relationship to virus strains from southeast Africa (Madagascar, Mozambique and Zambia).

Early detection was based mainly on clinical findings and only a small proportion of these outbreaks was confirmed by laboratory investigations. Delayed recognition and response to the new disease appears to have allowed infection to become widespread. By the second week of June, 52 out of 65 districts were suspected to be affected; more than 30 000 pigs had died and a total of 3 900 pigs had been culled. However, it was reported that only clinically ill animals within an infected herd had been culled, which may have contributed to ASF persisting and becoming endemic in the country. Most pigs affected were on open grazed fields or in free range systems. During January 2008, active infection was reported from three regions.

Armenia

Armenia first reported ASF on 6 August 2007 in the northern districts bordering Georgia. The source of the ASF virus entry into Armenia was probably the ASF epidemic in Georgia. It may have entered Armenia through legal or illegal movements of pigs and pig products, or from the movement of free-ranging pigs or wild boar across the border. There is insufficient information to identify the exact route of virus entry. Other potential transmission routes include persons who had visited affected premises in Georgia, swill feeding, meat scraps at picnic sites, and contact with contaminated fomites.

By 25 November 2007, the number of suspected ASF outbreaks in the two northern districts of Armenia had risen to 41. In total, around 3 600 pigs died of ASF and 4 300 were culled (Figure 1). During the same month, two other districts to the South (Yerevan and Ararat) experienced outbreaks (Figure 1). Further spread is almost certain to occur within and beyond the currently affected areas. No outbreaks were reported in January, but one case was diagnosed in February 2008.

Clinical signs of ASF in 3–4 month old pigs from a private backyard farm, Tavush Marz, Armenia



G. VARDANYAN



Russian Federation

On 4 December 2007, the Russian Federation reported to the OIE its first ASF outbreak since the 1970s. The report stated that five wild boar in the Republic of Chechnya, bordering Georgia (Figure 1) were positive. Although the precise introduction route into the country is unknown, it is likely to have been related to the outbreaks in neighbouring Georgia. If the wild boar populations are or become infected, the virus could potentially become endemic in the region, as occurred in the Iberian Peninsula (1960s, 1980s) and as occurs in Sardinia today. It is not known if competent vectors of the *Ornithodoros* genus of ticks, known vectors in Africa and parts of western Europe, are also present in the Caucasus region.

Azerbaijan

African swine fever was officially confirmed in Azerbaijan on 28 January 2008 in the village of Nic, Gabala District (northwest of the country, about 180 km east of the Georgian border, Figure 1). The majority of the inhabitants of Nic are Christian, explaining the relatively high number of pigs (4 600) in the village compared to other villages. The pigs were typically kept in backyard holdings and temporarily left outside during the day on pasture/communal land. In Azerbaijan, pigs are kept mainly for family consumption or small-scale local trade.

The local veterinary services believe that the ASF virus was introduced into Nic either by contaminated pork (or pork products) from Georgia or by infected wild boar at the beginning of January. However, the wild boar hypothesis is questionable, since no infected wild boar has been found so far in Azerbaijan or Georgia.

The main challenges in the area and the risk for the region

The spread of ASF within the region was facilitated by late detection of the disease and the limited ability of the veterinary services to control swine movement or marketing practices. As a result, the chance of ASF becoming endemic is high. Even with a late aggressive response, finding all free-ranging pigs and eliminating the disease in this population will be difficult.

If not contained, ASF could easily spread to other countries in the region and would have a protracted, direct effect on the productivity of the livestock industry, and an indirect effect on the food supply and thus food security.

As shown in Figure 2, the countries to the south and east of the Caucasus region (Iran (Islamic Republic of) and Turkey), have negligible pig populations related to the predominantly Muslim populations with isolated Christian communities. Therefore, the main risk of ASF spread is to the north and east (Russian Federation and Ukraine).

Infection in the wild boar population would complicate short and long term control. Wild boar might contribute to the spread of the virus since movement of wild boar between regions and countries cannot be managed. Although wild boar usually do not migrate, they will move great distances if pressed to do so (for example,

The spread of ASF
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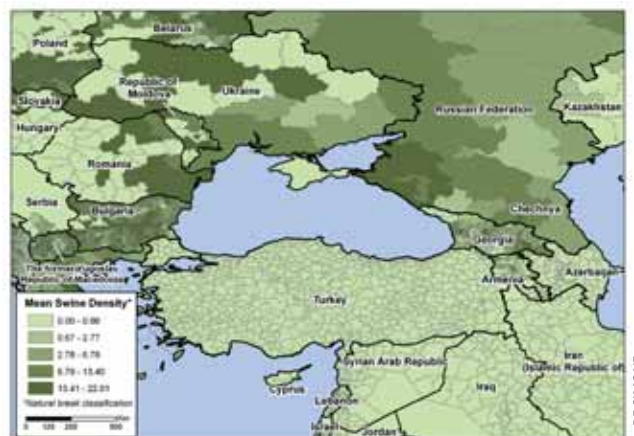
The pig industry in the Caucasus

Pig production systems vary across the countries of the Caucasus. The majority of pigs are kept in small backyard holdings, where there is lack of continuous containment of pigs and free roaming and scavenging are widely practised. Pigs let out during the day return to their pens at night. About 90 percent of the pigs in Georgia are backyard, kept in pig holdings with 1–2 pigs each. In Armenia, the situation is similar. In a limited area close to the border with Georgia, there is a substantial forest area where pigs are effectively feral throughout spring, and until they are brought back to their housing towards the end of autumn, to be confined and fed during the winter. In the southern and central areas of the country, backyard pigs are mostly fully confined in purpose-built housing. Traditionally, backyard pigs are traded either in free markets or through direct sale to the customers.

There are also some commercial farms holding a few hundred pigs under full confinement in specialized premises which, in Armenia, tend to be close to the major market of Yerevan. Commercial pig production with high standards of biosecurity is rare. Although there are few formal pig slaughterhouses, most butchering is carried out on the premises of origin, even in the larger commercial farms.

Rearing pigs is common and a traditional practice in rural areas. It represents an important source of meat for the population in the countryside and often generates valuable cash income. The impact of swine diseases on livelihoods, particularly those of the poorer smallholders, is severe. Without compensation in the event of incursion of an epidemic disease in a disease situation for which rapid reporting and response is required, owners are not likely to cooperate.

Figure 2: Swine density in the Caucasus, Eastern Europe and the Near East



Source: FAO GLiPHA – Gridded livestock of the world



by extreme weather conditions). There are few reliable data on wild boar populations and densities in the Caucasus area. However, wild boar distribution is closely linked to the forested areas they inhabit. Little is known about the potential role of wild boar in the spread and persistence of ASF, since this type of scenario has only been observed in Sardinia and Spain. However, for a disease with a lethality as high as that observed for ASF, it is reasonable to assume that a relatively high wild boar density is needed to maintain the infection, which appears not to be the case in the Caucasus region.

In addition to the above difficulties, potential vectors (*Ornithodoros* ticks) may be present in the Caucasus region. Should competent vectors be identified, additional efforts would be needed to change household and commercial practices, further complicating the control of infection since infection in these arthropod hosts may persist for several years or even decades. The presence of these vectors in and around pig pens, their biting habits and vector competence must be investigated.

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Source:

FAO-EMPRES Focus on African swine fever in the Caucasus: http://www.oie.int/eng/normes/mcode/code2006/en_chapitre_2.6.6.htm





Foot-and-mouth disease

FAO Reference Laboratory Contract Report: January–June 2008¹

There were no foot-and-mouth disease (FMD) outbreaks officially reported in FMD-free countries that did not practise vaccination between January and June 2008. Within Europe, the Scientific Commission for Animal Diseases of the World Organisation for Animal Health (OIE) recommended reinstatement of FMD-free without vaccination status for the United Kingdom and Cyprus starting on 19 and 21 February respectively.

There were no outbreaks
officially reported in
FMD-free countries that
did not practise
vaccination between
January and June 2008

Summary for the period January to March 2008

In the Near East, FMD outbreaks have been reported (February 2008) in cattle in northern **Israel** (serotype O) and **Lebanon** (no serotype reported). In Lebanon, the movement of infected animals via a local market (in Bekkaa province) has been proposed to be the likely route of infection. An increase in mortality due to FMD (serotype O) in **Bahrain** has been reported to the OIE and there have also been recent reports of FMD cases in **Kuwait**. Phylogenetic analysis shows a close relationship between FMD viruses recovered from these outbreaks in Bahrain and Kuwait and other members of the PanAsia II lineage (analysis described elsewhere in this report). Elsewhere in Asia, the FMD virus causing outbreaks of FMD in cattle in July 2007 in **Kyrgyzstan** have now been serotyped as A. There continue to be further outbreaks of FMD (serotype Asia 1) in **China**. During this reporting period, three cases have been detected in Ningxia Province in north-central China and additional cases in Xinjiang Province neighbouring Kyrgyzstan in the far west of the country. New cases of FMD have been reported in Viet Nam in March 2008 affecting two central provinces (Nghe An and Ha Tinh). In an attempt to control FMD, 100 000 animals in the central province of Quang Tri Province have been recently vaccinated with the trivalent (serotype O, A and Asia 1) vaccine.

In Africa, the FMD virus causing outbreaks in northern **Egypt** (Al Iskandariyah and Al Buhayrah) from September 2007 and January 2008 has been characterized as belonging to the new PanAsia II lineage of Serotype O. Introduction of infected animals via legal movement and contact at grazing and watering points has been implicated as the routes by which the virus has spread. To date, these cases represent the most southerly extension of this new lineage that has recently spread through the Near East. In January and February 2008, FMD outbreaks have occurred in **Nigeria** affecting cattle in the central state of Niger. The serotype of the causative virus has not yet been determined. Many cases of FMD have also been reported in two districts of Isingiro in **Uganda** close to the border with the United

*Natural cases of FMD in
Iran (Islamic Republic of)
in 2008, new (PanAsia II)
variant of type O*



IRAN VETERINARY ORGANIZATION (I/O)/EUFMD
PROJECT, IRAN (ISLAMIC REPUBLIC OF)

¹ Full report available at: http://www.fao.org/ag/againfo/commissions/docs/FAO-OIE-FMD_ReportJune08.pdf



Republic of Tanzania, resulting in a ban on livestock movement in the country's southern and western regions. In the south of the continent, 170 cases of FMD in cattle (no serotype designated) have been reported in the southern province of **Zambia**. The affected animals were in the Kafue plains, close to a game park where contact with wild animals may have occurred as a result of flooding due to heavy rains in the area. In **Namibia**, further serotype SAT2 outbreaks have been reported in the Caprivi Strip, close to the area affected by last year's outbreaks. Movement and quarantine restrictions in concert with ring vaccination (SAT1, SAT2, SAT3) have been employed in an attempt to control the spread of the disease. In January 2008, new FMD cases were reported in Sehithwa area, Botswana. The affected areas are further South of the Habu Extension, where the disease was confirmed in mid October 2007. Eleven cases of FMD have also been reported on the southern coast of **Mozambique**. The affected cattle (showing vesicular lesions on their tongues) had been moved from Tete province, in central Mozambique. 5 000 susceptible animals have now been vaccinated and quarantine and movement restrictions have been initiated.

Within South America, outbreaks of FMD continue to be reported in **Venezuela** (January 2008). The most recent of these was in the State of Merida in the west of the country. Elsewhere in the continent, vaccination programmes continue to be employed. In particular, in Paraguay, more than 360 000 cattle have been vaccinated in the departments of Amambay and Canindeyu, within the 15 km buffer zone established along the borders with Brazil.

In the Near East, an FMD outbreak was reported in cattle in Bahrain (due to serotype O) in April 2008

Summary for the period April to June 2008

In the Near East, an FMD outbreak was reported in cattle in **Bahrain** (due to serotype O) in April. Poor vaccination and uncontrolled animal movements were the suspected cause of the outbreak. Elsewhere in Asia, an untyped FMD outbreak is reported to be spreading in the townships in **Myanmar**, affected by Cyclone Nargis in the Irrawaddy delta and in the Rangoon and Pegu divisions. There is no estimate of the number of affected animals or when the outbreak first occurred. There continue to be further outbreaks of FMD (serotype Asia 1) in **China**. In **Viet Nam**, new cases of FMD have been reported in June, in 50 domestic animals in six communes in Trung Khanh District, in the northern province of Cao Bang.

In Africa, an outbreak was reported in Gaza, **Mozambique**, in April, affecting 11 cattle although the virus has not been typed. Authorized movement of animals had occurred prior to the appearance of the disease. Further outbreaks of SAT2 have been reported in Caprivi Strip, **Namibia**. Movement and quarantine restrictions in concert with ring vaccination (with SAT1, SAT2, SAT3) were employed in an attempt to control the spread of the disease. Viruses, isolated from recent samples sent to the World Reference Laboratory for FMD from FMD outbreaks in **Nigeria**, have been characterized as SAT2. To the south of the continent, the causative virus of the ongoing outbreak in **Zambia** which began in March was not typed. However, samples sent to Pirbright have been typed as SAT1 and SAT2. Illegal movement of animals is thought to be the cause of introduction.



Shipment of FMD samples for confirmation

Need to ship samples for confirmation? EMPRES can assist in the shipment of samples for transboundary animal diseases (TADs) diagnostic testing at an OIE/FAO reference laboratory and reference centres. Please contact empres-shipping-service@fao.org for information prior to sampling or shipment. Please note that sending samples out of a country requires export permit from the Chief Veterinary's Office of the country and one import permit from the receiving country. It is not as easy as one may think.

In Latin America, an outbreak in **Colombia** was confirmed 30 May 2008 in a defined zone in Cucuta, Norte de Santander, close to the Venezuelan border, with 27 male cattle being fattened for slaughter testing positive after 29 cattle showed signs of lesions. FMD sero-diagnosis was carried out by use of a 3ABC ELISA. In **Venezuela**, an outbreak of serotype A has been reported in the Sifontes region with disease detected in some cattle herds from seven farms in Tumeremo. Possible vaccination problems have been cited as the cause. An outbreak of serotype O was reported in Esmeraldas, **Ecuador**, thought to have been caused by the introduction of live animals from an unspecified location. Large scale vaccination programmes continue to be employed in the region.

Additional information:

During this reporting period WRL has received samples from **Gabon** for the first time, from **Somalia** for the first time since 1983, and from **Nigeria** for the first time since 1984–85. This is a welcome improvement in the geographical range of samples sent to WRL and may reflect the efforts of the European Commission for the Control of Foot-and-Mouth disease EuFMD² in encouraging sample submission from these regions. This is a positive move for the future with regard to obtaining regular 'real time' information on virus populations circulating in particular regions and will greatly aid informed disease management and control.

During this reporting period WRL has received samples from Gabon for the first time, from Somalia for the first time since 1983, and from Nigeria for the first time since 1984–85

Annual OIE/FAO FMD Reference Laboratory Network Report – January–December 2007³

Summary report on FMD outbreaks during period in question from the surveillance region covered by the reference laboratory

FMD in Europe

In 2007, two countries in Europe (previously FMD-free without vaccination) reported outbreaks of FMD: the United Kingdom and Cyprus. In the **United Kingdom**, FMD was initially confirmed on 3 August 2007 in beef cattle in Surrey: the first outbreak in the

² <http://www.fao.org/ag/againfo/commissions/en/eufmd/eufmd.html>

³ Full report available at: http://www.fao.org/ag/againfo/commissions/docs/Network_Rep_2007.pdf



IRAN VETERINARY ORGANIZATION (I/O)/EU/UMD PROJECT, IRAN (ISLAMIC REPUBLIC OF)

Natural cases of FMD in Iran (Islamic Republic of) in 2008, new (PanAsia II) variant of type O

country since 2001. Subsequently, a total of 8 premises (11 holdings) were found to have animals that were infected by FMD virus. These outbreaks occurred in two distinct clusters located around Normandy and Egham in Surrey. Nucleotide sequencing showed that the FMD virus responsible for these outbreaks was derived from O1/BFS 1860, an isolate used as a reference antigen and vaccine strain at the Institute for Animal Health and Merrial Animal Health Ltd located on the Pirbright site. Furthermore, analysis of full-genome sequence data was used to demonstrate that outbreaks near Egham (IP3-IP8) were derived from the Normandy cluster (IP1 and IP2), and not through an escape from the Pirbright site that reintroduced the virus into the field. Trade restrictions with the EU were lifted in December following three months without any subsequent outbreaks of disease. The United Kingdom's status of FMD free-without vaccination was restored by the OIE on 19 February 2008. In **Cyprus**, serological evidence of FMD infection was detected in small ruminants. The initial case was identified in October 2007 following investigation of a flock of 25 sheep which were exhibiting clinical signs suspicious of bluetongue or contagious ecthyma. FMD testing was carried out as a precaution, revealing that 8/25 animals were serologically positive for FMD virus non-structural proteins (NSP). In the light of these results, movement restrictions and investigations of neighbouring farms were undertaken. Although conclusive evidence of FMD virus circulation (antibodies against FMD virus structural proteins or FMD virus presence in oesophageal-pharyngeal samples was not obtained on the index, farm testing of further samples collected from neighbouring farms (near Larnaca on the southern coast of the island) revealed three flocks with serological evidence of FMD infection (including antibodies against FMD virus structural proteins of serotype O). Based upon the serological data and clinical evidence of vesicular lesions in some of the animals, the FMD outbreak was declared to the OIE on the 5 November 2007. Control measures to cull the affected sheep and goats were employed on these farms and in some additional flocks which were also found to contain serotype O seropositive sheep. Subsequent laboratory analyses were unable to detect the FMD virus in any of the material collected from vesicular lesions. Furthermore, despite collection of approximately 250 samples (mainly oesophageal-pharyngeal tissues samples) from the affected herds, no virus was detected. In addition, the ongoing circulation of FMD virus could not be substantiated using paired serology. Taken together with the age profile of the seropositive animals, the data indicate in-situ infection by FMD virus in the past (approximately three years ago). Further surveillance in the affected area and other parts of the island also failed to demonstrate active infection and serologically positive farms were not identified outside of the 10 km surveillance zone surrounding the culled Larnaca flocks. As from 21 February 2008, Cyprus has regained its FMD-free status without vaccination.

Elsewhere in Europe FMD continues to threaten the FMD-free areas

The issue of greatest concern is the emergence of a highly transmissible lineage of the PanAsia strain of serotype O which has spread from **India** to the east, north and west causing recent epidemics in a number of countries in the Near East. This picture mirrors



that seen prior to 2000–2002 when another O PanAsia strain spread into several FMD-free territories including France, Japan, Netherlands, South Africa, Republic of Korea, Taiwan Province of China and the United Kingdom. Although the O Manisa vaccine is predicted to provide protection against this new PanAsia variant, the vaccine has a slightly poorer serological match compared to O UKG 2001 PanAsia virus. During 2007, this lineage has spread west through Turkey to cause outbreaks in Thrace (in February and April, and more recently in September), and throughout **Jordan, Lebanon, Israel, West Bank and Gaza Strip** and into **Egypt**. In addition to serotype O, there have also been reported outbreaks due to serotype A (Iran 05 lineage) in **Turkey** and **Jordan**.

Central Asia

There continue to be sporadic reports of FMD from Central Asia, due to Asia 1. In addition to reports from **China** (Qinghai, Gansu and Xinjiang Provinces), in January 2007 this serotype has also caused the first outbreak in **Democratic People's Republic of Korea** since 1960. Although initial analysis indicated that serotype O had caused this outbreak, subsequent investigation of clinical material collected from affected animals recovered FMD virus serotype Asia 1. This outbreak was located in P'yongyan-Si. All susceptible livestock (466 cattle and 2 630 pigs) in the outbreak were destroyed. Outbreak areas of FMD due to serotype O have been reported in **Kazakhstan**, and due to serotype O and serotype A in **Kyrgyzstan**. Elsewhere in Asia, there continue to be reports of FMD in endemic areas including Bhutan, India, the Lao People's Democratic Republic, Malaysia, Myanmar and Viet Nam. The SEAFMD website (http://www.seafmd-rcu.oie.int/fmd_se_asia.php) provides maps showing countries in southeast Asia that have experienced outbreaks during 2007.

There continue to be sporadic reports of FMD from Central Asia, due to Asia 1

Africa

In October 2007, cases of FMD were recognized in cattle in the Maun District of **Botswana**. These outbreaks were located near the Okavango Delta in the north west of the country and are thought to have arisen via contact of domesticated cattle with wildlife due to damage to control fencing. Initial reports to the OIE indicated serotype SAT1 as the cause: however subsequent analyses of material by both Botswana Vaccine Institute (BVI) and World Reference Laboratory (WRL) typed the virus as SAT2. Counter-measures include control of wildlife reservoirs, livestock movement restrictions and vaccination of susceptible animals. In Namibia, FMD cases, also due to serotype SAT2, have been reported in the Caprivi Strip in November 2007. At the same time there was an outbreak due to serotype SAT2 in Kazungula, **Zambia**. Indications are that the outbreak probably started in **Zambia** and spread to Namibia due to cattle rustling. Control measures in both these outbreaks include movement restriction and vaccination. In South Africa, the area affected by an outbreak of SAT3 in 2006 has now been declared free of FMD.

Latin America

Outbreaks of FMD (serotype O) have been reported to the OIE from **Bolivia** (5) and **Ecuador** (10) during 2007. In addition, FMD virus serotypes O (9) and A (27) con-

tinue to cause outbreaks in **Venezuela**. In many countries of the continent, mass vaccination programmes are being employed to control FMD. A 15 km high surveillance zone (HSZ), not considered FMD-free, was created in the common borders of Argentina, Bolivia, Brazil and Paraguay, which is being closely monitored. Except for this HSZ zone, **Argentina** is now FMD-free either with or without vaccination. The region considered FMD-free without vaccination has been extended to include Northern Patagonia and the area of FMD-free status with vaccination (suspended due to the 2006 emergency) restored by the OIE. In **Brazil**, despite a large zone with status suspended, the state of Santa Catarina maintained its FMD-free without vaccination status. Part of the state of Para has been recognized FMD-free with vaccination. Further north, in **Colombia**, the border with Ecuador, part of the Valle and Caqueta and western Cundinamarca were declared FMD-free by the OIE. **Peru** added the central-eastern zone to the already recognized FMD-free without vaccination zone, reaching FMD-free status in over 85% of its territory.

A selection of the viruses received from around the world were further characterized by partial genomic sequencing and serological matching to vaccine strains. Phylogenetic analyses were performed by using complete VP1 gene sequences.

A selection of the viruses received from around the world were further characterized by partial genomic sequencing and serological matching to vaccine strains

Overall Conclusions

Most of the conclusions of 2007 are still appropriate to the current situation, most notably:

- FMD virus is still active in many parts of the world and continues to threaten FMD-free regions.
- Variable control efforts are in place in different affected areas worldwide.
- Mass vaccination is ongoing in much of China, India, South America and parts of the Near East.
- There is a continuing need to review risks and prioritise which vaccine strains should be selected for use.
- There have been no reports of outbreaks due to serotype C for the past three years. Therefore, it may be appropriate to consider whether continued vaccination against this serotype is necessary. Within geographical regions, the potential risk of improperly inactivated vaccines reintroducing this serotype needs to be balanced against the possibility of undisclosed serotype C infection remaining (due to this serotype) in domesticated livestock or wildlife.
- The outbreak in the United Kingdom demonstrated the need to strengthen and implement biosafety policies in order to prevent virus escape from vaccine manufacturing plants research laboratories.
- The 2007 outbreak in Cyprus poses questions regarding the diagnostic uncertainty and subsequent trade disruption that arose from the occurrence of undetected infection in small ruminants.
- The recommendation on vaccine strains provided by the FAO World Reference Laboratory for FMD to the Executive Committee of the European Commission for the Control of FMD remains unchanged.



O Manisa and A22 Iraq remain the most important vaccine strains for protection against viruses circulating in the Near East. Since some of the virus isolates that have been analysed show a strong match to these vaccine master seed viruses, emergency vaccination would require the use of high potency vaccines to guarantee protection and there may be a case for developing new vaccine strains with greater antigenic homology where cross protection is not considered high. Viruses of the A Iran 96 strain have not been recovered since June 2005, and therefore the importance of this vaccine appears less; it is likely to be relegated from priority in 2008. Asia 1 Shamir remains the vaccine strain of choice for this serotype.

In Africa, there is a great diversity of viruses circulating and in some cases, vaccines that provide good matches do not seem to be readily available. In South America, circulating viruses do not show significant antigenic drift or shift to warrant changes from O Campos and A24 Cruzeiro, although supplementary strains of serotype A are also used in some countries to improve vaccine match.

FAO-EMPRES in action

The Epidemiology of Avian Influenza in Africa project (EPIAAF) – Study implemented by the EMPRES-GLEWS¹ team in FAO

Introduction

The African continent recorded its first outbreak of highly pathogenic avian influenza (HPAI) in Nigeria on 8 February 2006. Since then Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Djibouti, Egypt, Ghana, Niger, Sudan and Togo have reported outbreaks of the disease in domestic poultry. The introduction of the HPAI virus represents a high risk of heavy socio-economic impact for many countries. The behaviour of the disease in Africa and its epidemiological pattern is different from that observed in other continents; the disease seems to have become endemic in some countries (e.g. Egypt), and has died out in others (e.g. Niger). Again, in other countries (e.g. Côte d'Ivoire), the disease, which was thought to have been brought under control, reappeared a few months later.



E. ETTER

Experts interviewing villagers with a questionnaire on poultry farming, Niger

Survey introduction

In order to enhance epidemiological knowledge in Africa, and to further explore the behaviour of the epidemic in the continent, an extensive survey entitled Epidemiology of Avian Influenza in Africa (EPIAAF) was launched by FAO in November 2007. The aim was to assess risk factors linked to the introduction, diffusion and persistence of HPAI. Several infected countries (Burkina Faso, Cameroon, Côte d'Ivoire, Egypt, Niger, Nigeria and Sudan) were included in the survey. Prior to the beginning of the study, a meeting had been organized in Cairo in April 2007 with the veterinary services from the beneficiary countries, to share the proposal and to discuss the expectations. The specific

objectives were reviewed; namely, to: i) describe HPAI situation and outbreak patterns (descriptive studies); ii) assess risk factors for the introduction, persistence and spread of HPAI in Africa (analytic studies); and iii) predict areas of high risk (predictive studies).

The French Agricultural Research Centre for International Development (CIRAD) was contracted to assist in the implementation of the study, with the support of other research institutes: Université Libre de Bruxelles (ULB), the Friedrich-Loeffler-Institut (FLI), the Royal Veterinary College of London (RVC) and the Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe). National consultants were hired in each country and were trained during a workshop held in Bamako in February 2008.

¹ Global Early Warning System



Survey methodology and preliminary results

In order to better understand the epidemiology of avian influenza in Africa, the study encompassed several components:

- a) Between February and April 2008, field missions were implemented in each country by a team of two international experts and the national consultant. They investigated and described epidemiological characteristics of outbreak and control sites. They also collated questionnaires with information on risk factors at the local level, and collected biological samples from poultry to assess the circulation of avian influenza (AI) or Newcastle disease (ND) viruses. A total of 43 sites in the seven countries were investigated, 53 questionnaires filled and 3 672 samples collected, as described in Table 1.
- b) Biological samples (tracheal and cloacal swabs and sera) were duplicated to provide: i) one set of samples to the FAO reference laboratory for avian influenza in Padova, Italy (IZSVE Padova) for virological and serological testing for AI and ND viruses; and ii) one set of samples stored in the national veterinary diagnostic laboratory. Reagents were provided to the national veterinary diagnostic laboratory to analyse samples and compare test results with those from Padova. To date, testing has been completed for Burkina Faso, Côte d'Ivoire, Niger, Nigeria and the Sudan. The first results indicate high to very high level of AI antibodies in chickens but at this stage no H5N1 HPAI virus has been isolated on gene sequences found. The high numbers of birds serologically positive for type A avian influenza may reflect a wide circulation of AI viruses or, in some places, residual immunity after vaccination.
- c) Epidemiological information was collected by the national consultants on HPAI outbreaks, surveillance and control measures implemented by the government, and on risk factors related to poultry production and trade, environment, veterinary services, and wild birds.

Table 1: Total number of domestic birds sampled per country and per species

	Chicken	Duck	Guinea fowl	Turkey	Pigeon	Geese	Total
Burkina Faso	544	37	82	7	0	0	670
Cameroon	-	-	-	-	-	-	338
Côte d'Ivoire	482	93	22	3	6	0	606
Egypt	168	115	0	2	4	13	302
Niger	471	104	74	2	32	2	685
Nigeria	399	34	2	31	5	0	471
Sudan	531	68	0	0	1	0	600
Total	2 595	451	180	45	48	15	3 672



E. ETIER

Domestic poultry sampling to assess animal health status, Niger.

- d) As part of data management, three databases were built covering: i) data collected at the national level by national survey consultants, ii) data collected at the local level through questionnaire investigation during the field missions, and iii) laboratory data. Once available, the data was to be consolidated into one unique database and shared with the Veterinary Services.

Next activities of the survey

During the remaining months of the survey (planned for July to September 2008), statistical analyses will be performed to address the epidemiological patterns of HPAI in Africa. After descriptive analysis of the data, exploratory geostatistical tests will be performed to query the contribution of the various parameters collected (i.e. environment, wildlife, veterinary services, retrospective HPAI outbreaks, poultry production and trade). It is expected that the comparison of data collected at national and local levels will provide valuable information on risk factors for HPAI presence and maintenance. The serological results on the prevalence of both avian influenza and Newcastle disease will be jointly undertaken, as their results may help to explain the connection between poultry and risk factors for disease. Finally, a model will be built to try to predict areas with the greatest likelihood of occurrence of HPAI.

Conclusion

This survey constitutes the first large-scale study of avian influenza viruses (including low pathogenic) and Newcastle disease in Africa. It is expected that valuable information will be obtained through the descriptive statistics and analyses. At the end of the survey, a feedback workshop is to be organized to present the results of the study, and to answer the key epidemiological questions about HPAI and poultry disease risks in Africa. A final report is planned for November 2008.

Acknowledgment

We would like to thank all the partners who assisted in the implementation of the survey: the National consultants recruited for the survey, the veterinary services of the beneficiary countries, the national and regional Emergency Center for Transboundary Animal Diseases (ECTAD) units, the scientific partner institutions and colleagues in FAO headquarters.



Workshops

Capacity building: Geographical Information Systems (GIS) applied to the surveillance and modelling of Transboundary Animal Diseases (TADs) in China

Background

Geographical Information Systems (GIS) can be applied as a valuable tool in veterinary epidemiology, for example, to determine patterns in animal health status in space and in time for a peculiar disease or condition. Through different levels of aggregation ranging from the hemispheric to the regional, national, district, or local level, GIS has been widely used to map the distribution of TADs such as foot-and-mouth disease, highly pathogenic avian influenza and Rift valley fever.

Beyond mere mapping, GIS can serve as an analytical tool to describe the behaviour of a disease. Under the widely used term of “Disease/Risk modelling” are many analytical GIS techniques that aim to improve the understanding of the ecology of animal diseases, and the capability to forecast the risk of disease occurrence in space and time.

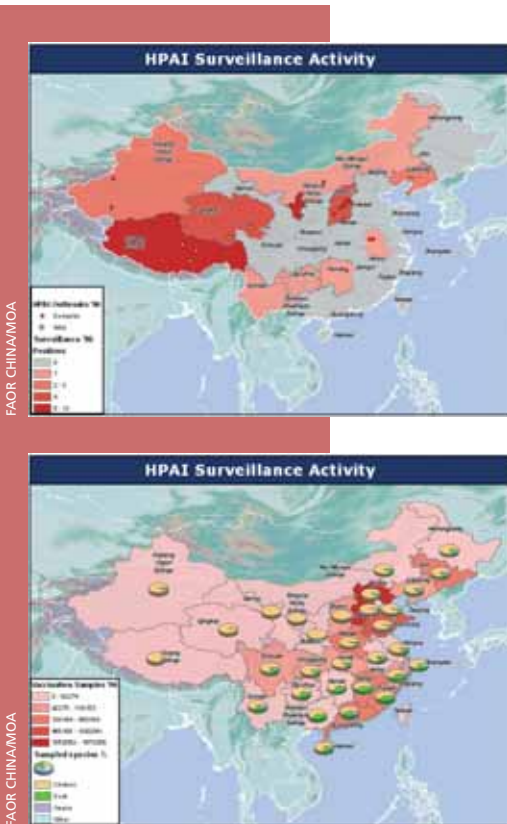
GIS enables the epidemiologist to perform operations that are valuable for decision analysis and decision-making: defining of buffer zones, determining the distance between features such as outbreaks, livestock facilities, specific ecotypes and rural landuse types, etc. Buffering allows contiguous or non-contiguous territories to be selected in order to form a virtual region or area; this makes it a very useful tool in the management of outbreaks as it helps to identify and characterize areas surrounding outbreak locations. Buffering captures the information on attributes of the surrounding areas or regions so that they can be categorised, managed and analysed. Distance determination makes it possible to calculate the real distance between outbreaks and features such as livestock markets, roads, rivers and wetlands or other agro-ecological factors, which in turn is very useful for the identification of features that are close in space to disease outbreaks, so that precautionary measures can be taken.

These techniques have been widely used since the beginning of the H5N1 HPAI epidemic in 2004, to better describe the importance of specific risk factors in the introduction, spread and maintenance of the disease in key ecosystems of South-East Asia, Europe and Africa. In early 2004, epidemiological studies carried out in Thailand and Viet Nam resulted in a better understanding of the mechanism underlying the maintenance of the disease and its spread, pointing out specific risk practices and farming systems (e.g. free ranging duck systems associated with rice production) and guiding efforts to design cost-effective plans to control disease. Most of these stud-



FAOR CHINA

GIS training workshop, China



Geographical Information Systems (GIS) applied to the surveillance and vaccination for H5N1 HPAI; data provided by the Chinese Ministry of Agriculture

ies used robust statistical approaches present in GIS which provides a user-friendly environment for disease modelling and brings visibility and clarity when communicating with decision-makers on the potential risks.

GIS applied in China

Since its first isolation in China in 1996, H5N1 virus continues to cause outbreaks in China and neighbouring countries. Thus, it is important to understand the agro-ecological and poultry production systems in China so that improved control of the disease, and spread over to other susceptible species can be prevented. A national technical cooperation programme (TCP project) was implemented (TCP/CPR/3004 E “Emergency assistance for the control of avian influenza”), to assist China in controlling the disease and strengthening its capacity in epidemiological investigations, disease surveillance techniques, GIS and enhanced laboratory diagnostics. This project was immediately followed by a USAID-funded project (OSRO/RAS/604/USA): “Immediate technical assistance to strengthen emergency preparedness for Highly Pathogenic Avian Influenza (HPAI)”, aiming at strengthening the country’s capacity in the areas of early warning, disease risk analysis and control.

In this framework, a training course in the use of GIS and spatial analysis applied to disease epidemiology was organized at the China Animal Health Epidemiology Center (CAHEC) in March 2008. The training course was attended by 40 participants, mostly veterinary epidemiologists working in CAHEC, with different backgrounds and skills in the use of GIS. In addition, professionals from Lanzhou FMD laboratory, Jiangsu Academy of Agriculture Science, Hunan and Guanxi Provincial Veterinary Services and Qingdao University joined the course.

During the training, the following topics were addressed:

1. GIS concepts, software, investigation of global spatial datasets provided from FAO;
2. Map design, epidemiological mapping, China surveillance data mapping and analysis;
3. Working with coordinate systems, geoprocessing, table management, spatial Analyst and spatial analysis techniques (density/proximity analysis);
4. Raster analysis (map algebra; zonal statistics; area tabulation); measuring geographical distribution of disease data; Introduction to disease/environmental database design and modelling;
5. Cluster analysis using specific softwares (e.g.SatScan); GPS use in the field and data management in the office.

The participants were guided through a series of lectures and practical sessions and practised the use of ArcGIS 9 software. The feedback received at the end of the training was very positive, both for the relevance and content of the course delivered.



Meetings

GREP regional meeting on official recognition of freedom from rinderpest for the Near East in Amman, Jordan, 26–28 February 2008¹

The three-day meeting was organized by the OIE/FAO Regional Animal Health Centre for the Near East, jointly with FAO's Global Rinderpest Eradication Programme (GREP) Secretariat. It was hosted by Jordan's Ministry of Agriculture Veterinary Services. The aim of the meeting was to identify mechanisms to facilitate and accelerate the process of accreditation of rinderpest freedom in Bahrain, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, United Arab Emirates, West Bank and Gaza Strip and Yemen.

The objectives of the workshop were to: i) ensure awareness of the OIE rinderpest freedom accreditation process through pursuit of the recently updated OIE Pathway; ii) assess the progress made in the region in the accreditation process; iii) identify prospects for achieving rinderpest freedom accreditation by 2010.



FAO

Opening Ceremony held at the Government of Jordan's Ministry of Agriculture Veterinary Services

Status of the Global Rinderpest Eradication Programme (GREP) in Africa, Asia and the Near East

The history of the progress in rinderpest eradication since 1980 was reviewed and GREP's objective of a Global Declaration of Rinderpest Freedom by 2010 was stressed. A summary was presented on the evolution of the situation in Africa and Asia, where the infection has not been reported or suspected since 2001. Attention was drawn to the situation in the Somali Ecosystem (an area covering Somalia, Djibouti, part of Ethiopia and part of Kenya), the last region in the world where the rinderpest virus could persist. Sero-surveillance activities have continued from 2002 to 2007 on wild and domestic ruminants, and during this period the overall sero-prevalence has decreased from 17 to 2.6 percent, and close to zero in late 2007. The situation worldwide was described regarding recognition of freedom from rinderpest by the OIE, and the action required in certain countries for achieving the global objective was delineated. The GREP has proposed an exceptional procedure for recognition of freedom from rinderpest in around thirty non-OIE member states. Current constraints to achieving the global objective were highlighted; most notably a loss of interest in some countries where rinderpest is no longer considered an important disease. Discussion focused on the situation in the Somali Ecosystem and additional information was provided, particularly regarding the practical aspects of surveillance in the area, and on how lessons learnt there could be useful for the Near East.

¹ Also available at: http://www.fao.org/ag/againfo/programmes/documents/grep/GREP_Recom_Feb08.pdf

The constraints affecting the achievement of Global Eradication are:

- Loss of interest because rinderpest is no longer recognized as an important disease.
- Of the almost 200 countries around the world, 172 are OIE Member countries and 192 FAO Member States. Weak country infrastructures for carrying out surveillance.
- Accountability and destruction of rinderpest viruses in frozen states.
- Unsanctioned production and use of vaccine.
- Possibility of reversion to virulence of a strain.
- Countries that do not trade animals do not see any need for accreditation.
- The geo-political situation in Western Sahara, West Bank and Gaza Strip.
- Armed conflicts and civil disturbances in non-free or questionable areas.
- Diversion of funds and greater attention given to other diseases (e.g. HPAI).

A country by country description was provided for the status of rinderpest in the Near East (table 1), and it was noted that the disease has not been reported in the region since 1996 and that the United Arab Emirates was the last country of the region in which vaccination had been carried out (2005).

Table 1: Status of rinderpest in the Near East

	Kuwait	Saudi Arabia	Oman	West Bank and Gaza Strip	Qatar	Syrian Arab Republic	United Arab Emirates
Cattle population	27359	350000	301558	35000	6689	1100000	55903
Date of last rinderpest case	1985	1994	1995	1982	1987	1983	1995
Date of last rinderpest vaccination	22 June 2002	August 2004	2000	1986	May 2003	2004	August 2005
Period of the next survey	Second Semester 2008	Second Semester 2008	Second Semester 2008	Second Semester 2008	Second Semester 2008	Second Semester 2008	Second Semester 2008



Recommendations

A) Considering that participant countries have agreed to recognition of freedom from rinderpest according to the OIE's official procedure, the participants recommend that:

1. FAO and/or OIE assist the countries concerned in developing surveillance strategies and preparing requests for accreditation of rinderpest freedom. This should be done without duplication of effort.
2. FAO, through its EMPRES-GREP unit and Technical Cooperation Programme, is requested to provide assistance to countries to strengthen all elements of rinderpest surveillance, including laboratory diagnostics kits;
3. FAO and OIE develop a Memorandum of Understanding with the Syrian Arab Republic and any other concerned country in the region, covering stock of vaccines or viral seeds;
4. The workshop scheduled to report on progress with rinderpest surveillance coincide with the GF-TADs² Regional Steering Committee in September 2008.

B) Considering the information provided by the participating countries on the most recent occurrences of rinderpest, use of vaccines and sero-surveillance activities, the participants recommend that:

5. Sanitary information throughout the WAHIS³ system be transmitted in a timely manner in accordance with the relevant chapter of the OIE Code (Chapter 1.1.2);
6. Bahrain should formulate and submit its dossier by September 2008 for evaluation by the next session of the rinderpest *Ad hoc* group due to be held in October/November 2008;
7. Based on FAO and/or OIE advice provided during the respective country missions, Kuwait, Oman, United Arab Emirates and Yemen should implement complementary serological surveillance in order to be able to submit their dossiers by December 2008;
8. Saudi Arabia, Qatar and the Syrian Arab Republic should start implementing their serological surveillance programmes and submit their dossiers by December 2008;
9. West Bank and Gaza Strip and Iraq should consider implementing specific surveillance, with FAO and/or OIE providing technical assistance;
10. Considering the distribution and movement of livestock and wildlife in the region, neighbouring countries should exchange relevant information to support their rinderpest dossiers.

² Global Framework for Progressive Control of Transboundary Animal Diseases

³ World Animal Health Information System

News**The veterinary world loses a respected colleague...**

Dr Yves Paul Cheneau, retired Chief of FAO's Animal Health Service died in Nice, France, on 6 July, 2008, after a short illness. He was surrounded by his family and close friends.

Dr Cheneau, a French national, was born in 1941 in Rabat, Morocco. He graduated from the Ecole Nationale Vétérinaire de Lyon, France in 1966, and obtained the title of Doctor of Veterinary Medicine in 1967, with a thesis on African horsesickness. The same year he received the Diploma of the Institut d'élevage et de médecine

vétérinaire des pays tropicaux (IEMVT), Maisons-Alfort, France. From 1972 to 1975, he undertook post-graduate studies in microbiology and immunology of viral and bacterial diseases at the University of Antananarivo, Madagascar and at the Institut Pasteur, Paris, France. Dr Cheneau began his professional career 35 years ago in the service of the French Government as veterinary inspector at the Ministry of Agriculture (1967) achieving the rank of General Inspector of veterinary services in January 1994.

Dr Cheneau's first professional post was as a District Veterinary Officer for the Ministry for Cooperation, France, posted in Rommani, Morocco, with duties in disease control and veterinary public health. From July 1969 to September 1970 he was the Deputy District Veterinary Officer, in Bambari, Central African Republic, for the Ministry for Cooperation, France. Dr Cheneau was involved in the control and prevention of blackleg and anthrax, field studies on native trypano-tolerant livestock, and participation in tsetse and trypanosomiasis control projects. From April 1971 to September 1974, Dr Cheneau worked as a microbiologist for the IEMVT, seconded to the Laboratoire National de l'Élevage, Antananarivo. During this period, he conducted research on bovine tuberculosis, including experimental vaccine trials, and the evaluation of prevalence of tuberculosis in national herds and developed proposals for improved control programmes. Over the next fifteen months, Dr Cheneau was stationed as an IEMVT Research Officer in microbiology at the Laboratoire National de Recherches Vétérinaires et Zootechniques de Farcha (LNRVZ), N'Djamena, Chad, responsible for diagnostics and research in bacteriology. He conducted research work on dermatophilosis as well as routine diagnosis and analysis of drinking water. He became the Director of the LNRVZ, a post he held until May 1980. As the Director of IEMVT veterinary research in the central Africa region [Cameron, Central African Republic, Niger, Chad], Dr Cheneau was responsible for regional research programmes as well as for livestock development projects.



From December 1980 to August 1981, Dr Cheneau was employed by IEMVT and the Office International des Epizooties (OIE) as the International Coordinator of an emergency rinderpest campaign in nine countries in West Africa (based in Ouagadougou, Burkina Faso, at the office of the Communauté Economique du Bétail et de la Viande). His tireless efforts led to the control of the rinderpest outbreaks in the region, allowing for the preparation of the larger Pan-African Rinderpest Campaign (PARC). In the course of the next two years, Dr Cheneau was *Chargé de mission*, General Directorate, IEMVT, sharing his time between the Maisons Alfort headquarters and the Laboratoire National Vétérinaire (LANAVET) in Garoua, Cameroon. Once LANAVET was constructed and equipped, it quickly became one of the most important and certainly the most modern diagnostic and vaccine production laboratory in Africa at the time. It was during this period that Dr Cheneau was also asked to coordinate the preliminary studies for building a high security laboratory in France for the study of exotic diseases, a project which included visits to similar facilities in Australia, the United States of America, Canada, and the Netherlands.

From October 1983 to April 1985, Dr Cheneau was appointed Assistant to the Director-General of IEMVT, seconded to the OIE and the OAU-IBAR for the preparation of the Pan-African Rinderpest Campaign (PARC), working at the OIE Central Office in Paris. His duties included the elaboration of programme proposals and funding requests; participation in the work on new norms for cell culture of rinderpest master seeds for improved vaccines; collaboration with the OIE Standards Commission; and the elaboration of rinderpest control and eradication strategies for Africa. This work led to the funding of PARC. During the following six years, Dr Cheneau was the Adviser to the Director, OAU-IBAR, in charge of PARC where he developed strategies for the rinderpest and contagious bovine pleuropneumonia; setting up of a network of rinderpest vaccine banks and organization of quality control; institution of emergency funds to be used in case of new outbreaks; the design, initiation, funding and monitoring of research programmes (role of wildlife and small ruminants in rinderpest epidemiology, thermostability of rinderpest vaccines; and, understanding the immunosuppressive effects of the virus); improvement of the quality of rinderpest and CBPP vaccines produced in Africa; strengthening of vaccine production units (structures, equipment, training); setting up of new diagnostic techniques and sero-surveillance throughout the African continent; epidemiological surveillance and sampling methods; analysis of data; the design of vaccination campaigns, preparation of budgets; field supervision; negotiations with African governments on implementation of structural reforms in the livestock sector; rehabilitation of veterinary services; re-organization of import, control and distribution of veterinary drugs (structures, price policies, revolving funds, gathering information on livestock owners...); liberalisation of veterinary medicine

(legislation, creation of veterinary associations and regulatory bodies, setting up of credit lines for creation of private practices, selection of candidates, monitoring); training and follow-up of community animal health workers within organized pastoralist or agro-pastoralist groups and societies, among other activities.

The Pan-African Rinderpest Campaign encompassed 34 countries with a total budget of €130 million (1986–1999), mainly funded by the European Community. Other donors were FAO, France, the International Agency for Atomic Energy (IAEA), Italy, Japan, Nigeria, the United Kingdom and the World Bank.

Dr Cheneau held the post of Chief, Animal Health Service, Animal Production and Health Division, FAO, from 1991 until his retirement in 2003. He was responsible for the planning, co-ordination and supervision of the work of the service, including technical support to FAO field activities; advice on policy development in the fields of veterinary information systems, sanitary legislation, infectious and parasitic diseases, animal trypanosomosis and vector-borne diseases, on strengthening structures and improving delivery of veterinary services; assistance to Member Countries during formulation and implementation of their animal disease control policies, and for maintaining relations with national and international development and research institutions. Among his many duties, he took on the challenge of setting up the EMPRES-Livestock Programme with exemplary commitment and technical knowledge, and was instrumental in incorporating the Global Rinderpest Eradication Programme (GREP) into EMPRES-Livestock.

Dr Cheneau was awarded the distinctions of: Chevalier dans l'Ordre National de la République du Tchad (1978), Chevalier dans l'Ordre National de la République française (1980), Chevalier du Mérite agricole de la République française (1985) and Officier du Mérite agricole de la République de Côte d'Ivoire (1992).

We join his family and friends in commemorating his achievements, his dedication, and above all his passion to improve the livelihoods of millions through improved animal health.

The Avian Influenza, Wildlife and the Environment Web (AIWEb)

The Avian Influenza, Wildlife and the Environment Web (AIWEb) is an online resource for information on avian influenza. Data was collated through the efforts of The Scientific Task Force on Avian Influenza and Wild Birds, in collaboration with FAO and UNEP/CMS (Convention on Migratory Species). AIWEb covers the following:

- Contingency planning and risk assessment
- Prevention and control
- Surveillance and early warning systems
- Epidemiological investigations
- Communication, education and public awareness

The AIWEb website can be accessed at:

<http://www.aiweb.info/document.aspx?DocID=285>





Meetings and Publications

Meetings and events

- 29th World Veterinary Congress, 27–31 July 2008, Vancouver, B.C., Canada.
More information available at: <http://www.worldveterinarycongress2008.com/>
- 4th International Conference on Antimicrobial Agents in Veterinary Medicine, 24–28 August 2008, Prague, Czech Republic.
More information available at: <http://www.aavmconferences.com/aavm2008/>
- Brucellosis 2008 International Research Conference, 10–13 September 2008, Royal Holloway, University of London, Egham, United Kingdom.
More information available at: http://www.defra.gov.uk/vla/news/new_conf_bruc.htm
- The Global Control of FMD – Tools, Ideas and Ideals, 14–17 October 2008, Erice, Sicily, Italy.

FAO Animal Production and Health publications

- Joint FAO/WHO/OIE Expert Meeting on Critically Important Antimicrobials; Report on the FAO/WHO/OIE Expert meeting, FAO Headquarters, Rome, Italy, 26–30 November 2007. <http://www.fao.org/ag/againfo/resources/documents/antimicrobials.pdf>
- Tsetse and Trypanosomiasis Information Bulletin Vol.30/2. <ftp://ftp.fao.org/docrep/fao/010/i0036e/i0036e.pdf>
- Standardizing land cover mapping for tsetse and trypanosomiasis decision-making (PAAT 8). <http://www.fao.org/ag/againfo/resources/documents/antimicrobials.pdf>
- Ayudando a desarrollar una ganadería sustentable en Latinoamérica y el Caribe: Lecciones a partir de casos exitosos. <ftp://ftp.fao.org/docrep/fao/010/I0082s/I0082s00.pdf>



New Staff

Adama Diallo

Adama Diallo (DVM, PhD), joined AGAH on March 2008 and will be working on the Service's portfolio on Reference Centres, on building up the Veterinary Laboratories Network throughout the African region, and providing research and diagnostic advice to member countries. Dr Diallo obtained his veterinary degree from the University of Toulouse, France, a postgraduate degree in virology from the Institute Pasteur in Paris, and a PhD degree in microbiology from the University Paris VII. He was head of the Virology Section at CIRAD-EMVT and later head of the Animal Production Unit within the Joint FAO/IAEA Division (AGE) in Vienna, Austria. Dr Diallo has spent many years working on rinderpest and peste des petits ruminants.

Vittorio Guberti

Vittorio Guberti (DVM) joined the EMPRES group of the Animal Health Service in February 2008. A graduate of the Faculty of Veterinary Medicine of Bologna Univer-



city (Italy), he was a researcher at the Italian National Wildlife Institute from 1986, and became head of the Veterinary Unit in 1996. Dr Guberti undertook post-graduate studies at the International Institute of Parasitology (St. Albans, United Kingdom), VEERU (Reading University, United Kingdom) and at the Institute of Zoology, Mathematical Epidemiology Section (Oxford University, United Kingdom). His work focused mainly on applied epidemiology with particular emphasis on the control and eradication of transboundary animal diseases in wildlife both in Italy and in other EU Countries. He worked as private expert for the European Community (DG Health and Consumer Protection, Public and Animal Health, Technical Information Exchange Office, European Food Safety Authority), and for the OIE on avian influenza, and classical and African swine fevers. Within the EMPRES group, Dr Guberti's portfolio focuses on country assistance in Eastern Europe and the Caucasus.

Sebastien Pesseat

Sébastien Pesseat is a webmaster and graphic designer who focuses on simplicity, usability and accessibility. He joined the EMPRES/GLEWS team in February 2008 to work on the development of the GLEWS website, using Joomla Content Management System with Google Maps technology. Sébastien graduated in Biology and Environment from the University Claude-Bernard of Lyon, and completed his studies with a Masters in image processing and multimedia from the University of Nice-Sophia Antipolis in 2001. He worked as webmaster for the CIRAD (Agricultural Research Centre for International Development), France, before joining FAO in in March 2002.



Contributions from FAO Reference Centres

FAO/OIE World Reference Laboratory for FMD, Pirbright, United Kingdom

Report from FAO World Reference Laboratory for FMD, January–June 2008

Country	No. of samples	Virus isolation in cell culture/ELISA ¹								SVD ⁴ virus	NVD ⁵	RT-PCR ² for FMD (or SVD) virus (where appropriate)	
		FMD ³ virus serotypes				Asia 1	Positive	Negative					
		O	A	C	SAT1				SAT2			SAT3	
Bahrain	3	3	-	-	-	-	-	-	-	-	3	-	
Botswana	11	3	-	-	-	6	-	-	-	5	6	5	
Ethiopia	28	4	1	-	4	1	-	-	-	18	8	20	
Gabon	12	-	-	-	-	-	-	-	-	12	-	12	
Iran (Islamic Republic of)	6	-	3	-	-	-	-	-	-	3	4	2	
Kenya	45	11	2	-	2	15	-	-	-	15	40	5	
Kuwait	10	10	-	-	-	-	-	-	-	-	10	-	
Namibia	1	-	-	-	-	1	-	-	-	-	1	-	
Nigeria	12	1	-	-	-	9	-	-	-	2	10	2	
Pakistan	58	31	1	-	-	-	-	-	-	26	40	34	
Saudi Arabia	10	7	-	-	-	-	-	-	-	3	10	-	
Senegal	8	-	-	-	-	-	-	-	-	8	2	6	
Somalia	4	3	-	-	-	-	-	-	-	1	4	-	
Turkey	34	9	23	-	-	-	-	-	-	2	33	1	
Zambia	8	-	-	-	3	1	-	-	-	4	6	2	
Total	250	79	30	-	9	33	-	-	-	99	177	73	

¹ VI/ELISA: FMD (or SVD) virus serotype identified following virus isolation in cell culture and detection ELISA

² RT-PCR reverse transcription polymerase chain reaction for FMD (or SVD) viral genome

³ FMD: foot-and-mouth disease

⁴ SVD: swine vesicular disease

⁵ NVD: no FMD, SVD or vesicular stomatitis virus detected



FAO/OIE World Reference Laboratory for Morbilliviruses, Pirbright, United Kingdom

Report form FAO World Reference Laboratory for Morbilliviruses, Pirbright, UK, January–June 2008

Country	Species	Number of samples	Disease	Diagnostic technique	Result
Italy	Dolphin	1	Dolphin morbillivirus infection	Nested RT-PCR	Negative
Nepal	Caprine	1	<i>peste des petits ruminants</i>	RT-PCR	Positive
United Arab Emirates	Gazelle	1	Rinderpest and <i>peste des petits ruminants</i>	C-ELISA	Negative
United States of America	Bovine	8	Rinderpest	C-ELISA	Negative



As of October 2008

Stop the press

Information presented in this bulletin concerns animal disease information up to June 2008. Since July 2008, there have been reports of more transboundary animal diseases (TADs) across the world.¹

Highly pathogenic avian influenza (HPAI) subtype H5N1. The disease continues to be present in Asia in India, Indonesia and Viet Nam. Bangladesh and the Lao People's Democratic Republic have experienced a reoccurrence of H5N1 HPAI after an apparent 'epidemiological silence'. In addition, H5N1 HPAI was also found in China, Hong Kong SAR in a wild bird (October 2008). In Africa, the disease continues to be found in Egypt, where the situation is considered endemic. Nigeria and Togo also reported outbreaks in July and September 2008, after several months with no apparent H5N1 HPAI activity. In Europe, H5N1 HPAI was reported in mixed domestic poultry in Germany (October 2008).

Low pathogenic avian influenza virus (LPAI) subtype H5N3 was reported in Germany in a zoo (October 2008), H5N2 LPAI was reported in the Republic of Korea (October 2008).

Foot-and-mouth disease (FMD) was reported in Malawi² (September 2008). The disease was also reported Botswana (SAT2) and Viet Nam (Asia 1).

African swine fever (ASF) was reported in Namibia and in the Caucasus area of the Russian Federation (October 2008).

Peste des petit ruminants (PPR) continued to be reported in Morocco. The analysis revealed that the outbreak was caused by the lineage IV which is predominant in the Near East and Asia.

Rift Valley fever (RVF) was reported in Swaziland (July 2008).

Bluetongue (serotype 1 and 8) continues to be reported in Europe. Serotype 6, previously absent in Europe and surrounding regions, has now been reported in The Netherlands.

Rabies was confirmed for the first time in Italy since 1995, from a dead fox (*Vulpus sp*) (October 2008).

Events:

FAO-OIE-WHO Joint Technical Consultation on Avian Influenza at the Human-Animal Interface, 7–9 October 2008, Verona, Italy.

The 6th International Ministerial Conference on Avian and Pandemic Influenza, 25–26 October 2008, Sharm el-Sheikh, Egypt.

¹ More information available at the OIE-WAHID website: <http://www.oie.int/wahid-prod/public.php?page=home>

² Not yet typed.



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