



PEDRO CAMPO, FAO

Nasal and ocular discharge, Ben Slimane Province, Morocco

Peste des petits ruminants (PPR): an increasing threat to small ruminant production in Africa and Asia

For a long time, PPR was incorrectly considered to be a West African disease. However, with the advent of specific diagnostic tests that enable differentiation between PPR and similar diseases, the known geographical distribution expanded quickly in the late 1980s and mid-1990s to cover all countries in Africa between the Sahara and the Equator, the Near East and the Indian subcontinent. At present, more than 1 billion sheep and goats in Africa and Asia are at risk of PPR (page 2).

Report on the molecular characterization of African swine fever virus (ASFV) samples received from Azerbaijan

This report describes the characterization of the ASFV responsible for recent outbreaks of the disease in Azerbaijan. Phylogenetic analyses were conducted using a combination of partial *p72* gene sequencing, full-length *p54* gene sequencing and analysis of tetrameric amino acid repeat regions within the variable region of the *B602L* gene. The data revealed that the *p72*, *p54* and *B602L* sequences of these isolates were identical to those of viruses responsible for ASF outbreaks in Georgia in 2007 (page 17).

Public release of the EMPRES Global Animal Disease Information System (EMPRES-i) website

EMPRES-i is a web-based application designed to support veterinary services by facilitating regional and global disease information. Timely and reliable disease information enhances early warning and response to transboundary animal diseases (TADs), including emergent zoonoses, supporting their progressive control and elimination (page 15).



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Peste des petits ruminants (PPR)

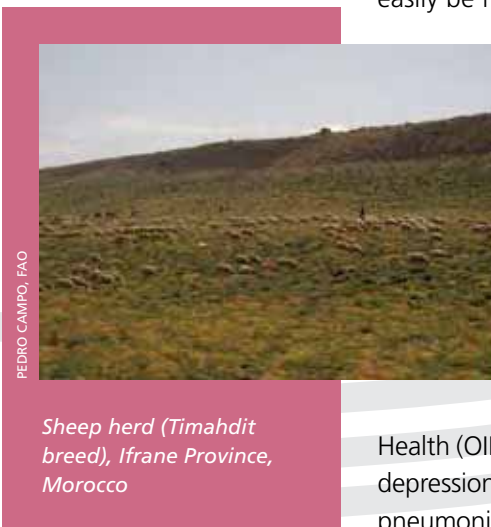
An increasing threat to small ruminant production in Africa and Asia

Introduction

Sheep, goats, swine and poultry are the main farm animals owned by the poor in most developing countries. Goats, the “cattle of the poor”, and sheep are reared as sources of not only milk and meat for family consumption, but also of income that can easily be mobilized for paying household expenditures, particularly in lean times. In addition to this economic role, sheep and goats have significant socio-cultural roles. They are used as gifts or sacrifices for traditional rituals and religious purposes, such as Eid for Muslims. Unfortunately, in many areas of Asia and Africa, small ruminant production – and therefore the livelihoods of poor farmers – is threatened by transboundary animal diseases (TADs) such as peste des petits ruminants (PPR).

A highly contagious TAD of wild and domestic small ruminants, PPR is caused by a morbillivirus similar to rinderpest virus (RPV). It is an infectious disease that spreads in endemic regions through nomadic herding and livestock trade, and it is on the list of economically important animal diseases to be notified to the World Organisation for Animal Health (OIE). The typical clinical form is acute PPR, which is characterized by high fever, depression and anorexia, followed by ocular and nasal discharge, erosive stomatitis, pneumonia and severe diarrhoea. High morbidity and mortality rates of up to 80 or 90 percent in affected herds make PPR an important killer disease for small ruminant populations. The direct economic losses caused by the disease are aggravated by the sanitary measures imposed by authorities to control animal movement and by trade restrictions on animal by-products. Not only does this severely affect rural economies, but it also reduces genetic resources and endangers breeding policies. Because of the negative economic impact on countries affected by PPR, the disease is one of the priorities of FAO’s Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) programme. In the early 2000s, an animal disease consultancy singled out PPR as an important animal disease to be taken into consideration in poverty alleviation policies (Perry *et al.*, 2002).

For a long time, PPR was incorrectly considered to be a West African disease. However, with the advent of specific diagnostic tests that enable differentiation between PPR and similar diseases, the known geographical distribution expanded quickly between the late 1980s and the mid-1990s to cover all the countries in Africa between the Sahara and the Equator, the Near East and the Indian subcontinent. Since the beginning of 2000, PPR has emerged in other areas, probably because of the intensification of animal movements and because the disease is increasingly well known and diagnosed. Since 2007, an estimated 1 billion sheep and goats in Africa and Asia are at risk of PPR.





PPR: an emerging disease in Asia since 2000

From the Indian subcontinent, which was a known PPR endemic area in the late 1990s, the affected zone expanded westwards to reach Afghanistan and Tajikistan in 2002 to 2004 (Kwiatek *et al.*, 2007). By 2007 the disease had progressed eastwards, with the first official recognition of PPR in China, in the Tibet area. The affected animals were goats, with apparent morbidity and mortality rates of 71 and 50 percent, respectively.

PPR: an emerging disease in central and north Africa since 2000

PPR's first appearance in Africa's equatorial zone was in Gabon in 1996. It was not until 2002 that PPR was recognized and diagnosed in neighbouring countries, the Congo and the Democratic Republic of the Congo. These countries are not important sheep- and goat-rearing zones, but the identification of PPR indicates that the disease had moved southwards, to threaten other countries, where it could cause significant losses.

After confirmation of the outbreaks, and to avoid further spread of the disease, FAO's Technical Cooperation Programme (TCP) project *Assistance d'urgence pour le contrôle de la peste des petits ruminants (PPR)* (Emergency Assistance for the Control of Peste des Petits Ruminants [PPR]) was implemented in the Congo from November 2006 to March 2008. Training was undertaken in PPR epidemiology, disease recognition and laboratory diagnostics. The national laboratory in Brazzaville received capacity strengthening in PPR sero-monitoring and testing of other TADs. A country-wide vaccination campaign was established, and more than 80 percent of the small ruminant population was vaccinated.

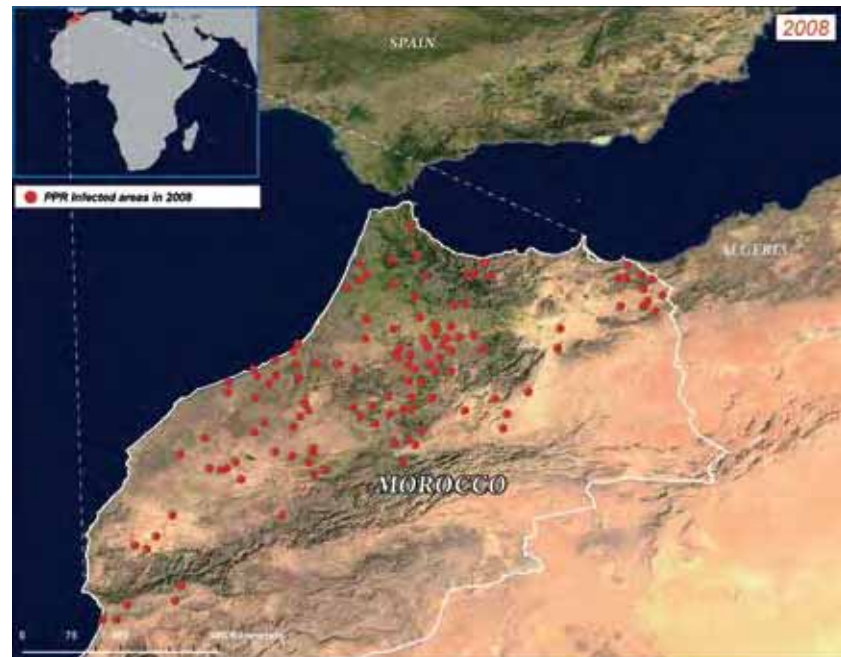
The most alarming PPR event in 2008 occurred in Morocco. Two outbreaks, detected in mid-July 2008 in the centre of the country, were officially reported to OIE by the Moroccan veterinary services. Through surveillance activities, the disease was found to be widely spread beyond the index farms to most of the central and northern parts of Morocco. By mid-November 2008, a total of 257 outbreaks were recorded in 36 of Morocco's 61 provinces. Apart from Egypt, which was first known to be affected by PPR in 1989, the Morocco outbreak is the first case of PPR in North Africa. This emerging situation is of great concern for neighbouring countries, especially Algeria and Spain, which historically have intense commercial interests in Morocco. In response to a request for assistance from Morocco's Ministry of Agriculture, the Crisis Management Centre – Animal Health (CMC-AH) at FAO sent a team of experts to Morocco in August 2008 to help the government implement urgent measures to control the disease. In spite of low overall morbidity and mortality rates (11.9 and 5.5 percent respectively) the Moroccan veterinary services reacted very

*Nasal and ocular discharge,
Ben Slimane Province,
Morocco*



PEDRO CAMPO, FAO

Figure 1: PPR in Morocco, 2008



Source: Laboratoire National d'Epidémiologie et des Zoonoses (LNEZ), Morocco.

quickly with an important vaccination campaign of small ruminants. In three months, about 20.6 million of the country's 25 million sheep and goats were vaccinated. This action rapidly controlled the disease. A TCP project was started in Morocco to help strengthen the country's PPR surveillance and to monitor the vaccination campaign. At present, it is not known how the disease entered Morocco, but its spread within the country was made possible by intensive sheep movements in July and August in preparation for Islamic festivals that took place a few months later.

Gene sequence analysis has facilitated the classification of PPR virus (PPRV) strains into four lineages. Lineages I, II and III are found in West, West-Central and East Africa, respectively. Lineage IV is found in the Near East and Asia. The sequence data of the Moroccan PPRV strain nucleoprotein gene show that this is a PPRV IV strain; this marks the first time this lineage has been detected in Africa, where all four lineages are now present.

PPR: an emerging disease in eastern Africa

In eastern Africa, PPR is known to have been present in the Sudan and Ethiopia since the 1980s. Kenya and Uganda officially reported their first outbreaks in the Turkana/Karamoja ecosystem in 2007. Since then, the PPR virus has been confirmed



in most pastoral areas in Kenya, Uganda and Somalia. It is now threatening northern parts of the United Republic of Tanzania, thus putting at risk the countries of the Southern African Development Community (SADC).

Kenya

The Kenyan authorities first suspected PPR in March 2006 in Loima and Oropoi Divisions of Turkana North District, Rift Valley Province. The PPR virus was isolated in August 2006 from samples from sheep and goats in two villages in Oropoi. The Kenyan authorities notified OIE of the country's first PPR occurrence in January 2007, and quarantine measures were put in place in Turkana. Between August 2006 and March 2007, a total of ten outbreaks were reported in four divisions of Turkana, with an overall morbidity rate of 13 percent (68 percent for the first two outbreaks) and a case mortality rate of 73 percent; young goats were the most susceptible. Participatory disease surveillance conducted in January 2007 in North, South and Central Districts of Turkana revealed a PPR morbidity rate of 82 percent and case mortality of 64 percent in 20 affected areas. A second survey was carried out in July 2007, in Samburu, Baringo and East Pokot Districts. Communities described a new PPR-like disease that had started two years previously. The annual herd PPR prevalence rate was found to range from 7 to 13 percent, and the annual herd mortality rate from 5.5 to 7 percent.

By the end of 2007, the disease was confirmed in nine districts: North and South Turkana, Moyale, Samburu, Baringo, East and West Pokot, Marakwet and Wajir. By September 2008, PPR had infected ten additional districts: Marsabit, Mandera, West Laikipia, Ijara, North Pokot, Isiolo, Garissa, Kajiado, Narok and Tana River.

Figure 2 shows the spread of PPR in Kenya: more than two-thirds of the country is infected, including all arid and a few semi-arid districts. Between February 2007 and September 2008, about 2.5 million sheep and goats, including 1.7 million in Turkana districts, were vaccinated. A multi-funded campaign to vaccinate about 15 million small ruminants was carried out with funds from the Kenyan government's Soaring Food Prices (SFP) initiative, the United Nations' (UN's) Central Emergency Response Fund (CERF), the United Nations Development Programme (UNDP) and FAO. This massive vaccination campaign covered both infected and at-risk districts. Reports from the Department of Veterinary Services indicate a decrease in new cases of the disease.



KISSA TOROTICH, DISTRICT VETERINARY OFFICER

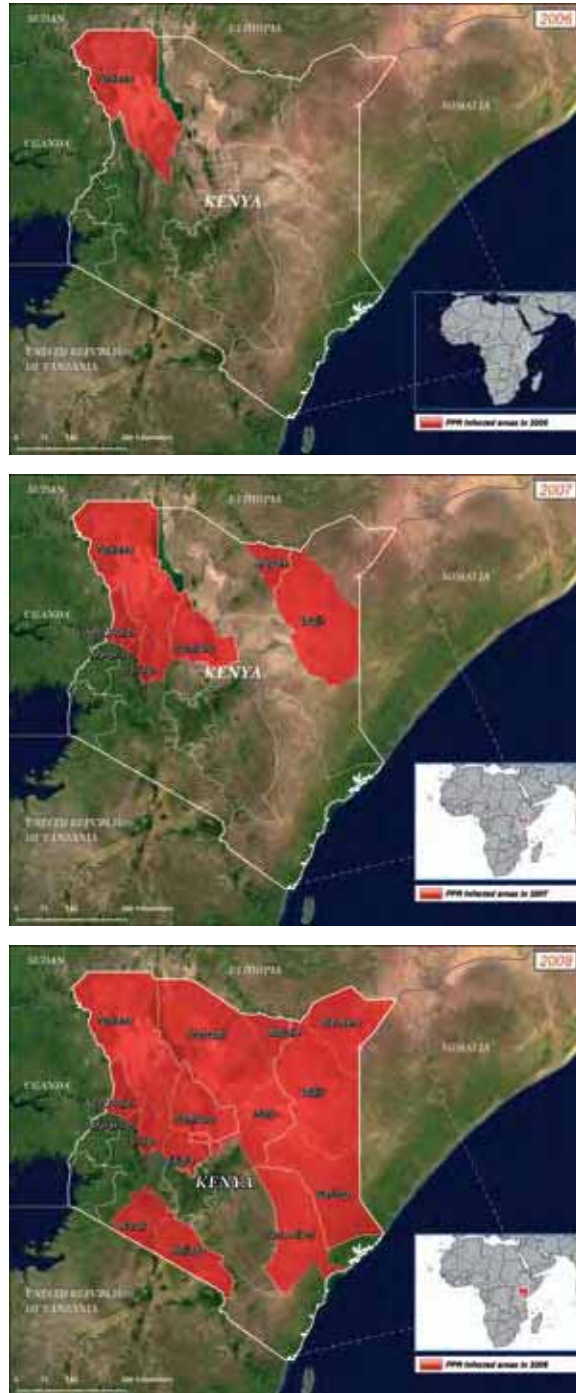
Active case of PPR in West Pokot, northern Kenya. Dehydration and weakness



JURIEN DRAAIER, FAO-KENYA

Active case of PPR in Turkana District, northern Kenya. Oral lesions

Figure 2: PPR in Kenya from 2006 to 2008



LORENZO DE SIMONE, FAO

Source: Generated using information obtained during implementation of project TCP/RAF/3113(E) and data from Ministry of Agriculture, Animal Industries and Fisheries (MAAIF)



Uganda

The PPR outbreak in Uganda is thought to have started in May 2006 in Kaabong and then Kotido Districts of the Karamoja area. Suspected cases were reported in neighbouring Moroto District in January 2007. The Moroto outbreak of April 2007 was confirmed and notified to OIE in July 2007, and quarantine measures were put in place. In September 2008, the five districts of the Karamoja area (Kaabong, Kotido, Abim, Moroto and Nakapiripirit) and two other districts (Kitgum and Kapchorwa) were reported infected. Following suspicions that the disease could have made incursions into zones neighbouring the seven districts known to be infected, serological studies undertaken using ELISA by the regional TCP project RAF/3113 showed evidence of PPR in Amuria, Bukedea, Bukwa, Katakwi, Lira, Pader and Sironko.

Figure 3: PPR in Uganda in 2007 and 2008



LORENZO DE SIMONE, FAO

Source: Generated using information obtained during implementation of project TCP/RAF/3113(E) and data from Ministry of Agriculture, Animal Industries and Fisheries (MAAIF)



It is thought that a third of Uganda's 8 million sheep and goats are at risk of PPR. There are no consistent consolidated data on mortality, but a rapid participatory assessment conducted by stakeholders in October 2007 in Karamoja indicated an estimated 200 000 to 400 000 deaths from PPR since the onset of the outbreak, affecting mainly goats. A multifunded vaccination campaign was initiated in December 2008 in the five districts of Karamoja, and 2.4 million doses of homologous vaccine were administered. The vaccination campaign should be completed by March 2009. Institutions and organizations involved include CERF, the Governments of Ireland and the Republic of Italy, and FAO. Other districts at high risk, including Mbale, Kapchorwa, Bukwa, Sironko, Kumi, Bukedea, Amuria, Katakwi, Kabiramaido, Padel, Kitgum and Lira, have also been covered by the vaccination campaign (Figure 3). Vaccination is ongoing in affected and high-risk districts through local, national and international non-governmental organizations (NGOs), supervised by government veterinary services.

In summary, PPR is fast spreading to the south of East Africa from its initial epicentre in Karamoja, Uganda, and Turkana, Kenya. The United Republic of Tanzania is currently infected, threatening other SADC countries that are currently free from the disease. This calls for prudent management of the disease through effective risk assessment, risk-based surveillance, improved border control, public awareness, appropriate sanitary measures and vaccination to avoid further spread in the SADC region. Should the disease spread further south, the results would be disastrous for native small ruminant populations. This would affect both food security and small ruminant trade, and have serious socio-economic consequences on stakeholders' livelihoods.

Conclusion

The importance of sheep and goats for farmers' livelihoods varies according to the agropastoral system in which they are raised; these animals are the main assets for the poor. In most countries where the disease is endemic, PPR is the main infectious killer disease of small ruminants, and therefore the most important threat to the livelihoods of poor farmers. Because of its high mortality rate, PPR affects food security directly by reducing the availability of meat and milk for family consumption and of funds for purchasing other commodities and foods, for which prices are increasing. The overall consequence of PPR outbreaks will be increased vulnerabilities for communities that are already facing such challenges as agroclimatic changes and civil unrest. PPR prevention and control should be considered a public good.

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PPR is the main infectious killer disease of small ruminants and therefore the most important threat to the livelihoods of poor farmers



Highly pathogenic avian influenza (HPAI)

The Epidemiology of Avian Influenza in Africa (EPIAAF) project: follow-up report of a survey implemented by FAO's Emergency Prevention System-Global Early Warning System (EMPRES-GLEWS) team

Objective of the survey

The objective of the EPIAAF survey was to improve understanding of the epidemiology of HPAI in Africa by assessing risk factors linked to the introduction, diffusion and persistence of HPAI outbreak foci in seven infected countries: Burkina Faso, Cameroon, Côte d'Ivoire, Egypt, the Niger, Nigeria and the Sudan.

Methodology and main activities

The methodology of the survey and its main activities were presented in *EMPRES Bulletin* No. 32. The survey was undertaken through a Letter of Agreement between FAO and the International Cooperation Centre of Agricultural Research for Development (CIRAD), and started in mid-November 2007. It was conducted by FAO collaborators from CIRAD, Montpellier, France, the Friedrich Loeffler Institute (FLI), Germany, the Istituto Zooprofilattico Sperimentale delle Venezie (IZSve, Institute of Veterinary Public Health), in Padua, Italy, the Royal Veterinary College of the University of London (RVC), the United Kingdom, and the Université Libre de Bruxelles (ULB, Free University of Brussels), Belgium, in cooperation with the veterinary services and veterinary diagnostic laboratories of the seven countries and with oversight from FAO/EMPRES. Eight national survey consultants were recruited: one for each country, apart from the Sudan, where two consultants were recruited. Field investigations were conducted at 43 sites (22 case sites and 21 control sites), 55 questionnaires were completed, and samples (tracheal swabs, cloacal swabs and sera) were collected from 3 672 birds.

The FAO Reference Laboratory in Padua, Italy performed the laboratory analysis: real-time reverse transcriptase-polymerase chain reaction (RRT-PCR) for the detection of avian influenza (AI) and avian paramyxovirus type 1 (APMV1) virus and enzyme-linked immunosorbent assay (ELISA) and/or haemagglutination inhibition (HI) tests for the detection of antibodies against type A influenza, H5 AI strains, H7 AI strains, and APMV1 virus. As shown in Table 1, no H5N1 viruses were detected, but AI antibodies were detected in more than 25 percent of the birds. Less than 1 percent of the birds were harbouring the Newcastle disease virus, but more than a third of them were positive to Newcastle-specific antibodies.

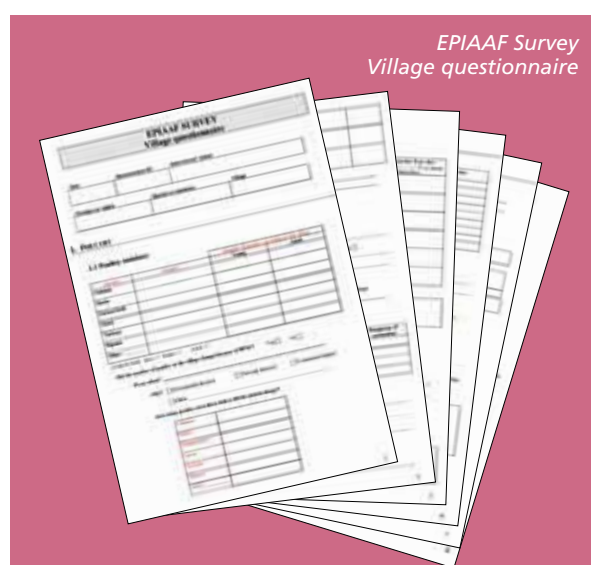


Table 1: Laboratory results

Test	Number of negative samples	Number of positive samples	% of positive samples
RRT-PCR for AI tracheal swab	3 641	0	0.0%
RRT-PCR for AI cloacal swab	3 627	0	0.0%
RRT-PCR for APMV1 tracheal swab	3 614	27	0.7%
RRT-PCR for APMV1 cloacal swab	3 614	13	0.4%
ELISA AI	2 606	933	26.4%
HI APMV1	2 322	1 197	34.0%
HI H5	3 392	108	3.1%
HI H7	3 495	0	0.0%



YAYA ABOUBAKAR

EPIAAF investigation, Malape, Cameroon

All the data collected (questionnaire data, data on risk factors at the national level, and laboratory results) were stored in an EPIAAF database created by FLI, and distributed to representatives of all the countries during a final workshop in Yaoundé at the end of September 2008. CIRAD, RVC and ULB performed data analyses using a range of methods, including descriptive and analytic approaches, such as univariate and multivariate analysis, principal component analysis and cluster trees.

Main findings

The main findings confirmed or put into perspective some reputed risk factors for H5N1 HPAI, and identified possible new risks that need further investigation.

Regarding the introduction of H5N1 HPAI:

- AI viruses are commonly circulating in poultry, and the proportion of seropositive birds seems too low to confer satisfactory flock immunity for protection against H5N1 HPAI (protection against low pathogenic AI [LPAI] needs to be assessed).
- In addition to wildlife, the trade of poultry and poultry products also has a potential role in virus introduction, although it is difficult to capture the diversity and complexity of trade relationships through this type of survey.

Regarding the characteristics of H5N1 HPAI outbreaks:

- In 2006, for the sites surveyed, the delay between detection and reporting of signs averaged four days; that between reporting and investigation by veterinary authorities was even shorter, averaging one day. In contrast, the delay



between detection of signs and confirmation of an outbreak by a reference laboratory was far longer, at 56 days on average.

- Morbidity and mortality varied significantly according to species, but case fatality rates were similar.

Regarding the persistence of H5N1 HPAI virus:

- When H5N1 and/or other AI viruses are circulating in previously infected or seemingly never-infected sites, fewer than 5 percent of birds are shedding the virus at a specific point in time (at least during the period of the survey).
- The species composition of the poultry population varied very widely, depending on the country and the site; a correlation was found between the spatial structures of AI seroprevalence and poultry composition. More investigation is needed to identify whether species composition could play a role in the persistence of the virus.



ANJA GLOBIG

EPIAAF investigation,
Bobo-Dioulasso, Burkina Faso

Regarding the dissemination of H5N1 HPAI outbreaks:

- There is insufficient application of good production practices, including the management of sick birds and the disposal of dead ones.
- Seasonal high mortality in backyard poultry is not systematically reported because it is assumed to be due to Newcastle disease. This is likely to contribute to under-reporting of HPAI.
- Vaccination against H5N1 produced unsatisfactory seroconversion rates; further investigation is needed to identify the reasons for this.
- Delayed or incomplete culling of poultry in outbreak sites was reported. This increases the chances of virus dissemination.

Other factors highlighted included asymptomatic infection, trade by intermediaries and live bird markets. The role of each is difficult to determine and requires additional studies.

Recommendations

The following recommendations were made, based on the survey's main findings and discussions with country representative during the final workshop:

- update and improve poultry census data;
- implement standardized outbreak investigations to improve surveillance and epidemiologic knowledge;
- improve vaccination;
- build up local diagnostic capacities;
- facilitate the shipment of samples within Africa and from Africa to international reference laboratories;
- increase communication efforts;
- direct surveillance activities to risk spots or key epidemiologic points, such as live bird markets, intermediaries, and border sanitary inspection posts; and
- share knowledge through regional networking.



Conclusion and acknowledgments

This survey was the first large-scale study of AI viruses (including LPAI) and Newcastle disease in Africa. It generated valuable information through descriptive statistics and analyses, and it answers some key epidemiologic questions about HPAI in Africa, highlighting the roles of trade and breeding practices in disease dissemination, and the limited level of virus circulation. A final consolidated report will be made available on the EMPRES Web site.

FAO/EMPRES and CIRAD would like to thank all the partners who assisted with survey implementation: national consultants, national veterinary services, national and regional Emergency Centre for Transboundary Animal Disease Operations (ECTAD) units and scientific partner institutions.





Foot-and-mouth disease (FMD)

FAO Reference Laboratory Contract Report July to September 2008

No outbreaks were officially reported in FMD-free countries that did not practise vaccination between July and September 2008.

Asia

The FMD virus serotype O-PanAsia-2 strain (ME-SA topotype) continues to dominate in the Near East region (the Islamic Republic of Iran, Pakistan, Saudi Arabia and Turkey), while most outbreaks in Southeast Asia (Lao People's Democratic Republic and Thailand) appear to be of the O Mya-98 strain (SEA topotype). In the Near East (Afghanistan, the Islamic Republic of Iran, Jordan, Pakistan, Saudi Arabia and Turkey), the A-Iran-05 (Asia topotype) has dominated for the last three years. Since August 2007, however, a new sublineage of this strain (A-Iran-05ARD-07) has been found in Turkey. In Southeast Asia, a local unnamed strain of type A has been circulating for several years, without any introductions from outside the region. No Asia 1 viruses have been submitted to the World Reference Laboratory (WRL) for FMD from recent outbreaks, but the serotype continues to circulate in parts of China. As India is an important reservoir of FMD virus (FMDV), there is need to clarify the relationship between O, A and Asia 1 viruses circulating in India (and monitored by India's Project Directorate on FMD in Mukteshwar) and those from neighbouring countries catalogued by the WRL for FMD.

East Africa

In Kenya, types O, A, SAT1 and SAT2 continue to be isolated. In Somalia, type O viruses (EA-3 topotype) have been linked to those occurring in Yemen, although viruses belonging to EA-3 probably originate in the Horn of Africa.

West Africa

In Nigeria, outbreaks of type O and SAT2 have been linked to viruses occurring in the Sudan. Samples from a suspected outbreak of FMD in Gabon were negative by virus isolation and RT-PCR.

Southern Africa

FMD SAT2 continues to cause problems in northern Botswana, northeast Namibia (Caprivi strip) and southern Zambia. There appear to have been at least three introductions into Botswana during 2007 and 2008. It is not clear whether the origin is wildlife (African buffalo) in Botswana or cattle/wildlife in neighbouring countries.

In September 2008, a suspected outbreak of FMD was reported on Kaombe Ranch, Nsanje, southern Malawi (the first since 2003); the results of laboratory test-

No outbreaks were
officially reported
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and September 2008



ing are awaited. Tracing the origin of the infected animals indicated that some were brought in from an area close to Lengwe National Park, which harbours buffaloes that were a source of the 2003 outbreak.

South America

In July and August 2008, an outbreak of FMD type A was reported on three farms in Sardinata, Norte de Santander, Colombia (the first since February 2005).

New vaccine recommendations

WRL vaccine recommendations have been changed to reflect the variation in FMDV serotype A activity in the Near East and western Asia. The A Iran 96 strain has been reduced from high to medium priority, reflecting the continued dominance of the A Iran 05 strain. The A22 Iraq vaccine remains a high priority to cover A Iran 05, although it has been noted that recent Turkish isolates of the A Iran 05 strain (A-Iran-05ARD-07) showed a poor antigenic match to A22 Iraq vaccine. The SAT2 vaccine used in Botswana showed limited cross reactivity to some recent isolates from Botswana and neighbouring countries.

An up-to-date list and reports of FMD viruses characterized by sequencing can be found at www.wrlfmd.org/fmd_genotyping/2008.htm.

The full report is available at www.fao.org/ag/againfo/commissions/docs/fao-oie-fmd_rep_july-sept08.pdf.



Information systems

Public release of the EMPRES Global Animal Disease Information System (EMPRES-i) Web site¹

EMPRES-i is a web-based application designed to support veterinary services by facilitating regional and global disease information. Timely and reliable disease information enhances early warning and response to transboundary animal diseases (TADs), including emergent zoonoses, and supports their progressive control and eradication.

EMPRES-i aims to clarify disease events worldwide using information from numerous sources: country or regional project reports, field mission reports, partner non-governmental organizations (NGOs), cooperating institutions, government ministries of agriculture and health, FAO in-country representations and other United Nations parties, public domains, the media and web-based health surveillance systems. For verification, EMPRES uses not only official, but also unofficial sources of information (such as in-country assistance projects and personal contacts with NGOs and other institutions). This ensures a good level of awareness on TADs and zoonoses. The information is used to generate and disseminate early warning messages, and is also fed into the EMPRES-i database where, having been confirmed or denied, it is presented to the public in a structured format.

EMPRES-i provides updated information on global animal disease distribution and current threats at the national, regional and global levels. It also provides access to publications, manuals and other resources, such as the contact details of chief veterinary officers (CVOs) and FAO reference centres.

The platform is an EMPRES response to users' growing demand for animal health information systems with one-touch disease information gathering and sharing formula. Different users will be assigned different levels of access to confidential and detailed information. The system is under continuous development and new features will be added in the future. At present, public users have access to the following features:

- **Disease events database:** Under the Disease Events tab, EMPRES-i users can access and retrieve information on animal disease outbreaks/cases throughout the world, using such criteria as disease, date, species and location. The data can then be easily exported into two formats (PDF and Excel) for further analysis.
- **Mapping/graphing tools:** These allow users to select outbreaks/cases from the database and represent them graphically as charts (by time or location) or geographically on maps, which can be tailored by adding optional layers, such



¹ URL: <http://empres-i.fao.org/>



as livestock population, biophysical features, socio-economic aspects, animal health and trade. These layers are created and maintained by the Global Livestock Production and Health Atlas (GLiPHA), which is a user-friendly, highly interactive electronic atlas using the Key Indicator Data System (KIDS).

- **Library:** In the Library section, FAO technical material, such as books, bulletins, reports, newsletters, manuals and guidelines, can be searched according to various criteria. The library allows users to search information related to the current situation, epidemiology, diagnoses and control of TADs, by document type, topic, language, date or free text.
- **Directory:** The Expert Directory section provides contact information for FAO reference centres, World Organisation for Animal Health (OIE)/FAO reference laboratories, and national authorities, including CVOs in each country. EMPRES-i users can search by location, disease, category or free text.





Special Communication

Report on the molecular characterization of African swine fever virus (ASFV) samples received from Azerbaijan

Abstract

African swine fever (ASF) causes an acute haemorrhagic fever in domestic pigs. It is classified as a notifiable disease by the World Organisation for Animal Health (OIE).

In June 2007, cases of ASF affecting domestic pigs in the Caucasus region of Georgia were confirmed and reported to OIE. By 9 July 2007, the outbreak had spread to 56 of 61 districts in Georgia, and more than 80 000 pigs had died or been destroyed. Outbreaks of ASF were also reported in neighbouring regions, including the autonomous Republic of Abkhazia, Armenia and the Russian Federation. The disease continued to spread, and clinical cases of ASF were recognized on 22 January 2008 in Nidj village in Quebele District, north-central Azerbaijan. This report describes the characterization of the ASF virus (ASFV) responsible for the outbreak in Azerbaijan. Phylogenetic analyses were conducted using a combination of partial *p72* gene sequencing, full length *p54* gene sequencing and analysis of tetrameric amino acid repeat regions within the variable region of the *B602L* gene. The data revealed that the *p72*, *p54* and *B602L* sequences of these isolates were identical to those of viruses responsible for ASF outbreaks in Georgia in 2007.



MARISA ARIAS

Herd of domestic pigs

The study

FAO facilitated the submission of clinical material comprising eight tissue samples taken from two dead pigs at separate localities in Quebele District, north-central Azerbaijan. The samples were submitted to the Animal Health Research Centre (CISA-INIA), Valdeolmos, Spain (FAO Reference Centre and the European Union's [EU's] ASF Reference Laboratory) for ASF confirmatory diagnosis and molecular characterization of the causative ASFV strain(s). DNA was extracted directly from 10 percent suspensions of homogenized pooled tissues from each pig, using a commercial nucleic acid extraction kit according to the manufacturer's procedures. Following a *p72* gene-based polymerase chain reaction (PCR) diagnostic assay (Agüero *et al.*, 2003), the animals from Azerbaijan were confirmed as being infected with ASFV. Virus isolation was performed on porcine alveolar macrophages cultures (Malmquist and Hay, 1960) using homogenized pooled tissues from each PCR-positive animal. Two haemadsorbing ASFV strains, Az08B and Az08D, were isolated from the animals after two passages in porcine alveolar macrophages.

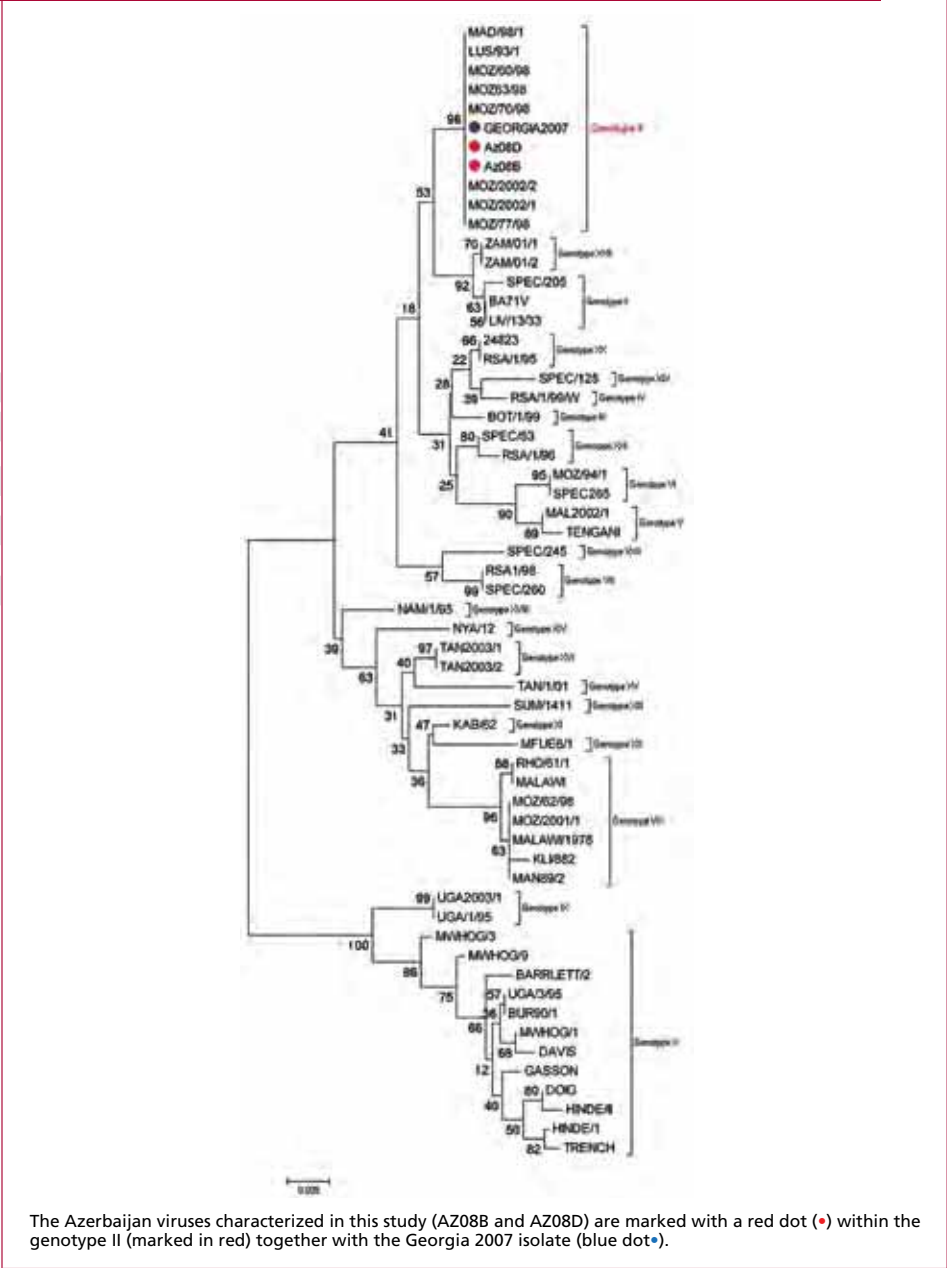


CARMINA GALLARDO

African swine fever in a domestic pig

To classify the Azerbaijan ASFV isolates obtained according to previously defined major genotypes, the C-terminal end of the *p72* gene was amplified and sequenced using the primers *p72* U/D (Bastos *et al.*, 2003). The nucleotide sequences generated were compared with at least two virus representatives of each of 22 (I to XXII) *p72* genotypes identified in a previous study (Boshoff *et al.*, 2007). A 404

Figure 1: Minimum evolution tree showing the 22 known ASFV *p72* genotypes from ASFVs (I to XXII)

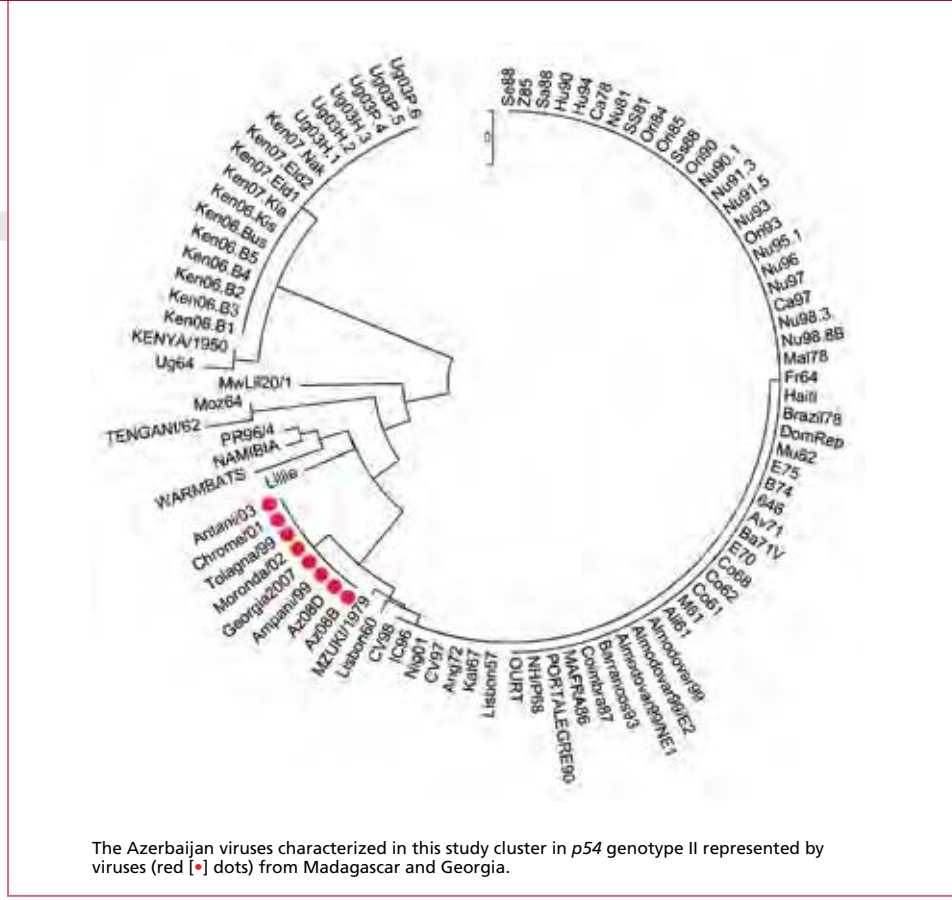




bp region was used to infer a *p72* gene phylogeny using the neighbour-joining (NJ) and minimum evolution (ME) methods as implemented in the MEGA v4.0 program (Kumar *et al.*, 2001). The Azerbaijan viruses were placed within *p72* genotype II, together with the Georgia 2007 isolate (Figure 1). This genotype comprises six isolates obtained from Mozambique (MOZ/2002/1, MOZ/2002/2, MOZ/60/98, MOZ63/98, MOZ/70/98, MOZ/77/98) one from Madagascar (MAD/98/1) and one from Zambia (LUS/93/1).

The same result was obtained from sequencing the complete gene that encodes the ASFV *p54* protein. Recent studies have demonstrated the value of *p54* gene sequencing as an additional, intermediate-resolution, molecular epidemiologic tool for the typing of ASFV viruses (Gallardo *et al.*, 2008). Following amplification with primers PPA89/PPA722, the sequences obtained were compared with ASFV *p54* sequences available in GenBank belonging to the 14 *p54* genotypes previously identified (Gallardo *et al.*, 2008). The ASFV Azerbaijan isolates were classified in *p54* genotype II (Figure 2), together with the Georgia 2007 isolate and five Madagascar

Figure 2: Minimum evolution unrooted tree depicting the 14 *p54* genotypes identified among 92 ASFV isolates



isolates obtained from outbreaks between 1998 and 2003 (Moronda02, Ampani/99, Tolagna/99, Chrome/01 and Antani/03).

The *p72* and *p54* genes were useful for initial classification of the Azerbaijan isolates, but to investigate whether other ASFV genotypes were present in these samples, an additional conventional typing PCR was performed by analysis of the variation and distribution of tetrameric amino acid repeat regions within the variable region of the *B602L* gene. These amino acid repeats were investigated using primers 9RL/9LF (Nix *et al.*, 2006). As for the *p72* and *p54* genotyping, comparison of amino acid tetrameric repeats located in the *B602L* gene revealed that viruses associated with the Azerbaijan outbreaks were identical to those obtained from outbreaks in Georgia in 2007. Ten copies of the amino acid tetramer were encoded (type BND-BNDBNAA); the sequence of these tetramers was unique to this group of viruses, which includes viruses from Madagascar, Georgia and Mozambique. Together, these findings support the conclusion that ASFV corresponding to a single genotype II was present in the material.

Conclusions

ASF is widespread in sub-Saharan Africa and was reintroduced into Europe in June 2007, in the Caucasus region of Georgia, spreading to neighbouring countries (Azerbaijan). Analysis findings of the *p72* gene, the *p54* gene and the variable region within the open reading frame (ORF) *B602L* were identical to those of the virus isolated in Georgia in 2007. It can therefore be concluded that the ASF outbreaks in Azerbaijan were probably due to a single reintroduction of the virus from Georgia. The closest viruses to the Azerbaijan and Georgian ASF virus isolates are from southern Africa or Madagascar rather than West or Central Africa or Sardinia.

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ASF is widespread in sub-Saharan Africa and was reintroduced into Europe in June 2007



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Workshop

FAO assistance to selected countries in fulfilling OIE Rinderpest Pathway goals: recommendations of the launching workshop for the Surveillance for the Accreditation for Freedom from Rinderpest in Africa project

A launching workshop for FAO project TCP/RAF/3202, Surveillance for the Accreditation for Freedom from Rinderpest in Africa was held in Yaoundé, from 25 to 26 September 2008. The workshop was attended by delegates and representatives from the African Union-Interafrica Bureau for Animal Resources (AU-IBAR) and the World Organisation for Animal Health (OIE), epidemiologists from participating countries (Cameroon, Central African Republic, Chad, Djibouti, Kenya, the Niger and Nigeria), staff from the Cameroon Ministry of Livestock, and the Director of the National Veterinary Laboratory (LANAVET – *Laboratoire National Vétérinaire*). During the workshop, each participating country's epidemiologic situation and financial resources for the Global Rinderpest Eradication Programme (GREP) were reviewed in terms of GREP's projected deadline for a Global Freedom Declaration in 2010. The following recommendations were made:

1. Beneficiary countries should develop rinderpest surveillance strategies and submit them to GREP and IBAR by 15 October 2008 for review and commentary.
2. The Central African Republic and Kenya should identify the organizations with which GREP will collaborate, through Letters of Agreement, for completion of the necessary epidemiologic surveillance activities.
3. GREP should enter an agreement with a partner organization to implement wildlife epidemiologic surveillance for rinderpest virus activity in the countries surrounding Lake Chad.
4. The required epidemiologic surveillance activities will involve visits to 300 epidemiologic units, with sampling of 15 to 17 animals (of one to three years of age) at each (guidelines on surveillance for rinderpest,¹ Appendix 3.8.2).
5. A laboratory refresher training course should be held at Vom, Nigeria.
6. All dossiers should be submitted to OIE, with copies sent to GREP and IBAR, before the middle of January 2009, for review by the OIE Ad Hoc Group for Rinderpest meeting scheduled for February 2009.

In addition to the TCP funds, FAO/GREP dispatched kits for testing samples, including from wildlife, to laboratories in Asia, the Caucasus and the Near East.

¹ www.oie.int/download/SC/2007/eng_annexe_3_8_2.pdf



Meetings

Session of the Research Group of the Standing Technical Committee of the European Commission for the Control of Foot-and-Mouth Disease (EuFMD), Erice, Italy, 14 to 17 October 2008

The EuFMD Research Group open meeting held in Erice, Italy attracted wide participation from both FMD endemic and FMD-free regions of the world. Participants included 180 FMD experts from across the world, giving a truly global character to the meeting and its outcomes. This worldwide network of researchers provides experience, advice, guidance and services to international agencies and FAO Member States.

The meeting considered eight items relating to the technical factors that constrain improved regional and global FMD control, through seven keynote papers and 66 presentations. Two debates were held and 42 posters presented. A panel discussion with representatives of the World Organisation for Animal Health (OIE), the European Commission, the Global FMD Research Alliance (GFRA) and the President of EuFMD was followed by a presentation on developing a global strategy for progressive control of FMD.

The issues discussed included global FMD control through coordinated regional actions:

- opportunities and constraints;
- optimizing programmes when resources are limited;
- vaccination issues – overcoming antigenic diversity to simplify prevention programmes, and innovative vaccine delivery approaches;
- progress updates;
- the FMD vaccine standards required for global control;
- biosecurity and buy-in – measuring progress in global and regional FMD control, and early warning of FMD virus emergence;
- diagnostics – making quality service available where needed, and components and capacity for effective control; and
- prospects for integrating antiviral approaches.

Participants discussed the concept of a training bank, to promote the banking of useful resources for staff training in the veterinary and technical skills required for FMD recognition, surveillance, diagnosis and response following a peer-to-peer approach.

Participants created videos on aspects of FMD in all areas of the world, and uploaded them on YouTube: <http://uk.youtube.com> (use the keyword “eufmd”).

Regional meeting on foot-and-mouth disease (FMD) to develop a long-term regional control strategy, Shiraz, Islamic Republic of Iran, 9 to 13 November 2008

The first regional workshop on FMD control in West Eurasia was held in the Islamic Republic of Iran in November 2008, with the participation of 15 countries. The meeting was organized by FAO, in consultation with OIE, and hosted by the Iran



Veterinary Organization. This was the first meeting to involve all the countries affected by the regional type O and A epidemics in 2005 to 2008; its aim was to develop a plan for longer-term control. The workshop was convened as a joint meeting under FMD projects implemented by EuFMD in Turkey, trans-Caucasus, the Islamic Republic of Iran, the Syrian Arab Republic, and the EMPRES GTFS/INT/907/ITA project for central Asian countries.

The workshop's objectives were to:

1. develop consensus on the vision and long-term goals for FMD control in the region and on the main elements of a long-term strategy for FMD control in the west Eurasian FMD ecosystem; and
2. share information on FMD virus circulation within the ecosystem to assist the planning of short-term preventive measures.

The meeting introduced the innovative concept and assessment tools of FAO's Progressive Control Pathway (PCP) for FMD and applied them to the regional situation. The participants endorsed this risk-based approach and developed a vision of: "Regional cooperation among Eurasian countries for the progressive control of FMD through public and private partnerships leading towards freedom of clinical disease by 2020, for economic development, food security and poverty alleviation."

Outcome and outlook

1. A vision statement and the West Eurasian FMD Roadmap were developed for the progressive control of FMD in the region.
2. It was recognized that the vision requires a coordinated set of national efforts under an overall framework of progressive risk reduction, supported by regional services and the sharing of information, technical knowledge and advocacy for donor support among countries in the region.
3. The workshop recommended the establishment of regional-level programmes to improve laboratory services, information systems, planning tools and FMD vaccination campaigns and to resolve transboundary animal movement issues. A Secretariat should be established to coordinate these support services.

FAO Progressive Control Pathway – risk reduction approach

- Stage 0. Risk of FMD not controlled, continuous FMDV circulation.
- Stage 1. Critical risk points addressed, decrease in FMD incidence.
- Stage 2. FMD under control, discontinuous circulation.
- Stage 3. Approaching FMD freedom, with fewer than one outbreak per year.
- Stage 4. International recognition of FMD freedom, with vaccination or without vaccination, in country or zones.



4. A framework was developed for monitoring progress, based on indicators of country progress in risk identification and risk management along the five stages (0 to 4) of the proposed PCP. Despite great disparities in risks and resources, it was foreseen that all countries should attain at least level 3 by 2020.
5. Implementation of the West Eurasia Regional Roadmap would benefit countries beyond western and central Asia, reducing risk in Europe, the Near East and North Africa.
6. Implementation of the roadmap would also encourage and complement efforts in China, India and Southeast Asia.
7. The workshop recommended that FAO and OIE convene at least one meeting a year at which to monitor progress, with an initial regional meeting to be held in November 2009.
8. There is need for a framework for securing long-term national participation in the roadmap. The meeting also recommended that a Shiraz Declaration, or similar instrument, be developed for endorsement by relevant ministries in each participating country, prior to the OIE/FAO International Conference on FMD Control planned for June 2009.

The Sixth International Ministerial Conference on Avian Influenza and Pandemic Influenza, Sharm El-Sheikh, Egypt, 25 to 26 October 2008

Government ministers and senior officials representing more than 120 countries were joined by international and regional organizations, NGOs, private entities, donors and researchers at a conference hosted by the Government of the Arab Republic of Egypt with the purposes of: 1) ensuring that the world is fully prepared to mitigate the impact of an influenza pandemic; 2) sustaining efforts to control highly pathogenic avian influenza (HPAI), especially in poultry, with the eventual eradication of H5N1 from domestic animals in the remaining contaminated countries; and 3) initiating longer-term action to respond to infectious diseases that are capable of causing severe damage and affecting livelihoods. Additional information is available at www.fao.org/docs/eims/upload/251299/aj209e00.pdf.

News

New FAO Emergency Centre for Transboundary Animal Disease Operations (ECTAD) Web site at the Regional Animal Health Center (RAHC), Bamako, Mali



The web site is a working tool for all partners and countries in West and Central Africa. Its purpose is to enhance the flow and sharing of information on:

- the mandate and activities of regional ECTAD units;
- ongoing projects, workshops and seminars; and
- specific topics – such as production, health, communication and socio-economics – within the frame of regional network documentation and links to other FAO and partners' official sites.

The FAO-ECTAD Web site at RAHC is at www.fao-ectad-bamako.org/fr/?lang=en.

Meetings and publications

Meetings and events

- Joint FAO/OIE Regional Meeting for an Official Recognition of Rinderpest Freedom in the Middle East, Jordan, 26 to 28 February 2009.
- 5th World Poultry Conference, Taba, Egypt, 10 to 13 March 2009. <http://wpc2009.googlepages.com/home>.
- 7th International Symposium on Avian Influenza, Athens, Georgia, United States of America, 5 to 8 April 2009. www.georgiacenter.uga.edu/conferences/2009/apr/05/avian.phtml.
- 38th General Session of the European Commission for the Control of Foot-and-Mouth Disease (EuFMD), Rome, 28 to 30 April 2009. www.fao.org/ag/againfo/commissions/docs/genses38/provagenda38thgenses.pdf.
- Programme Committee meeting of the Programme Against African Trypanosomiasis, Smolenicfe, Slovakia, 7 to 8 May 2009.
- Roundtable on *Brucella melitensis* infection in animals: Towards Sustainable and Coordinated Brucellosis Control in the Near East and Eurasia, FAO, Rome, 11 to 15 May 2009.
- 3rd EPIZONE Annual Meeting, Crossing Borders, Antalya, Turkey, 12 to 15 May 2009.
- 77th OIE General Session, Paris, 25 to 29 May 2009.
- Global Rinderpest Eradication Programme (GREP) Expert Consultation meeting, Rome, 2 to 3 June 2009.
- FAO/International Atomic Energy Agency (IAEA) Symposium on Sustainable Improvement of Animal Production and Health, Vienna, 8 to 11 June 2009. www-pub.iaea.org/mtcd/meetings/pdfplus/2009/cn174/cn174_flyer.pdf.



- OIE/FAO Global Conference on Foot-and-Mouth Disease, Asuncion, Paraguay, 24 to 26 June 2009. www.oie.int/eng/a_fmd2009/welcome-fmd.html.
- Executive Committee of EuFMD, Slovenia, 21 to 24 September 2009.
- 16th Congress of the World Veterinary Poultry Association, Marrakesch, Morocco, 22 to 26 September 2009.
- Fifth Consultative Group Meeting on Contagious Bovine Pleuropneumonia (CBPP), FAO, Rome, October 2009.

FAO Animal Production and Health publications

- FAO Animal Production and Health Paper No. 165: *Biosecurity for highly pathogenic avian influenza*, FAO, Rome. <ftp://ftp.fao.org/docrep/fao/011/i0359e/i0359e00.pdf>.
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New staff

Morgane Dominguez

Morgane Dominguez (DVM) joined the EMPRES/Global Early Warning System (GLEWS) team of the Animal Health Service as an Associate Professional Officer in November 2008. She graduated in veterinary science at the French Veterinary School of Alfort, Maisons Alfort, France in 2005 and first worked at the French Institute for Public Health Surveillance on infectious disease surveillance and response in Saint-Maurice. In 2007, she joined the French Food Safety Agency, Maisons Alfort, where she worked on animal disease monitoring and risk assessment of emergency animal health situations.

Sergei Khomenko

Sergei Khomenko is a national of Ukraine and joined FAO/EMPRES in September 2008. He has worked extensively on spatial modelling of AI risks, as well as investigating ornithological aspects of the spread of the disease and participating in ongoing wild bird avian influenza surveillance activities in cooperation with the Ministry of Agricultural Policy of Ukraine. Sergei speaks fluent English, Russian and Ukrainian. Before coming to FAO, he led the Avian Influenza Working Group at the Institute of Zoology of the Ukrainian Academy of Science, created in 2005. He has worked for many years with Wetlands International and the National Ecological Centre of



Ukraine and carried out consultancies for FAO's Emergency Centre for Transboundary Animal Disease Operations (ECTAD) before joining the team in September. Sergei is currently engaged in the Eastern Europe and Central Asia region as Wildlife Training Coordinator and part of the EMPRES/Wildlife Unit.

Guillaume Kondolas

Guillaume Kondolas (DVM, MSc) joined the EMPRES/GLEWS team of the Animal Health Service in May 2008 to work on disease tracking and data management. He obtained his veterinary degree from the Faculty of Veterinary Medicine in Bucharest, Romania. He first worked in the Epidemiology and Diagnosis Service, Central African Republic, later becoming Head of the Immunology Section at the Veterinary Central Laboratory in Bangui. In 1995, he joined the Animal Health Division as Chief of the Epidemiosurveillance Service. He served as a coordinator for the Pan African Rinderpest Campaign (PARC) from 1997 to 2000 and for the Pan African Programme for the Control of Epizootics (PACE) from 2000 to 2001. In 2002, he obtained a Master's degree in animal production from the International Cooperation Centre of Agricultural Research for Development (CIRAD), Montpellier, France. He holds an Advanced Veterinary Certificate (CEAV) in animal pathology and epidemiosurveillance (2003) and a Diploma in Higher Veterinary Studies (DESV) in animal health and animal production (2004) from the National Veterinary College of Toulouse (ENVT), France. From May 2005 to July 2007, he worked for the World Animal Health Information System (WAHIS) and the World Animal Health Information Database (WAHID) at the World Organisation for Animal Health (OIE) in Paris.

Tracy McCracken

Tracy McCracken (DVM, MSc) is a wildlife biologist and veterinarian who joined FAO/EMPRES in November 2008 as the Deputy Wildlife Unit Coordinator. Tracy received a veterinary degree from Virginia Tech (United States) and an MSc, focusing on wildlife-livestock conflicts, from the University of Edinburgh (United Kingdom). She has worked on numerous wildlife projects worldwide covering a variety of species from rodents to carnivores. Her last posting was with the United States Agency for International Development (USAID) as Animal Health Technical Advisor in the Office of Agriculture. Tracy is currently responsible for evaluating and managing the wildlife aspect of transboundary animal diseases (TADs) and their effects on livestock, including poultry, and human health. Most of this work focuses on understanding the role of wild birds in the maintenance and movement of H5N1 highly pathogenic avian influenza (HPAI).



Contributions from FAO Reference Centres

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

Report from FAO World Reference Laboratory for FMD, July to December 2008

Country	Number of samples	Virus isolation in cell culture/ELISA ¹								SVD ³ virus	NVD ⁴	RT-PCR ⁵ for FMD (or SVD) virus (where appropriate)	
		FMD ² virus serotypes							Asia 1			Positive	Negative
		O	A	C	SAT 1	SAT 2	SAT 3						
Bahrain	4	-	2	-	-	-	-	-	-	2	3	1	
Bhutan	3	2	-	-	-	-	-	-	-	1	3	-	
Botswana	7	-	-	-	-	6	-	-	-	1	7	-	
Ethiopia	26	8	3	-	-	6	-	-	-	15	16	10	
Lao People's Democratic Republic	5	5	-	-	-	-	-	-	-	-	5	-	
Malaysia	3	-	-	-	-	-	-	-	-	3	3	-	
Namibia	3	-	-	-	-	3	-	-	-	-	3	-	
Thailand	15	10	2	-	-	-	-	-	-	3	14	1	
Zambia	5	-	-	-	5	-	-	-	-	-	4	1	
Total	71	25	7	-	5	15	-	-	-	25	58	13	

¹ FMD (or SVD) virus serotype identified following virus isolation in cell culture and antigen detection ELISA.

² Foot-and-mouth disease.

³ Swine vesicular disease.

⁴ No FMD, SVD or vesicular stomatitis virus detected.

⁵ Reverse transcription polymerase chain reaction for FMD (or SVD) viral genome.



**FAO/OIE Reference Laboratory for Rinderpest and Peste des Petits Ruminants,
Montpellier, France**

Report from FAO Regional Reference Laboratory for PPR, International Cooperation Centre of Agricultural Research for Development (CIRAD), Montpellier, France, July to December 2008

Country	Species	Sample	Number of samples	Number of positives/doubtful	Test	Nature of the test Confirmatory or tentative
RPV¹/PPRV²						
Morocco	Ovine	Blood/tissue	52	28/2	RT, QRT-PCR ⁴ and isolation	Confirmatory
Sudan	Caprine/camel	Tissue	189	2/2	RT-PCR ³	Confirmatory
Tunisia	Ovine/caprine	Serum	382	29/11	C-ELISA ⁵	Confirmatory
United Republic of Tanzania	Caprine	Blood/tissue	6	2	RT and QRT-PCR	Confirmatory
DMV⁶						
France	Marine mammals	Tissue	23	9	RT-PCR	Confirmatory
Vaccine contaminants						
Botswana	-	BTV ⁷ vaccine	2	-	Quality control ⁸	Pass
Italy	-	BTV vaccine	1	-	Quality control ⁸	Pass

¹ Rinderpest virus.

² Peste des petits ruminants virus.

³ Reverse transcriptase-polymerase chain reaction.

⁴ Quantitative reverse transcriptase-polymerase chain reaction.

⁵ Competitive enzyme-linked immunosorbent assay.

⁶ Dolphin morbillivirus

⁷ Bluetongue virus.

⁸ Sterility test + PCR (RPV, PPRV, bovine viral diarrhoea [BVD] virus, mycoplasma) + titration (cytopathic effect [CPE]) visualized by immunofluorescence test using an anti-PPR monoclonal antibody (anti-PPRV Mab) + sequencing.



Stop the press

Information presented in this bulletin concerns animal disease information up to December 2008. From January to May 2009, there have been reports of more transboundary animal diseases (TADs) across the world.¹

Influenza A/H1N1: A new strain of H1N1 is currently spreading in the human population all over the world. According to the United States Centers for Disease Control and Prevention (CDC), the influenza A subtype H1N1 isolated from humans in April 2009 was a genetic reassortment of four different influenza virus strains, including human influenza gene segments, swine influenza from North America and Eurasia, and avian gene segments from North America, never before reported among swine or human isolates from anywhere in the world. Influenza A/H1N1 virus was reported in pigs in Canada (April 2009). Supported by EMPRES disease tracking and data analysis, the Crisis Management Centre – Animal Health (CMC-AH) organized a multi-agency mission to assist the Mexican veterinary services with epidemiologic assessment and laboratory diagnosis with a focus on capacity building. The CMC-AH team was composed of experts from CDC, FAO, OIE, the Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA) and the United States Department of Agriculture. See Influenza A H1N1 Web site: www.fao.org/ag/againfo/programmes/en/empres/ah1n1/background.html.

Peste des petits ruminants (PPR): *Update of page 2 of this issue:* Following reports of high mortalities of sheep and goats with clinical signs of contagious caprine pleuropneumonia (CCPP) and PPR in the northern Maasai districts of the United Republic of Tanzania, an investigation team from the departmental and regional veterinary investigation centre was deployed. Six districts were found to be infected through serological testing: Longido (84.4 percent), Ngororo (55.5 percent), Mbulu (46.6 percent), Monduli (35.5 percent), Siha (31.7 percent) and Karatu (33.3 percent). On 27 January 2009, the United Republic of Tanzania officially reported to the OIE its first occurrence of PPR, which affected sheep and goats in Soitasambu Village, Ngorongoro (Arusha Region). Morbidity and case fatality rates were reported as 9.2 and 30.4 percent respectively.

Highly pathogenic avian influenza (HPAI) subtype H5N1 was reported in China (February and April 2009), Lao People's Democratic Republic (February 2009), Nepal (January 2009) and India (January to March 2009). Avian influenza H5N1 infection was reported in wild birds in Germany (March 2009) and China (February 2009² and May 2009). The disease continues to be reported in Bangladesh, Egypt, Indonesia and Viet Nam.

Low pathogenic avian influenza virus (LPAI) subtype H7N7 was reported in Germany (April 2009). LPAI subtype H7N9 was reported in the Czech Republic (February to March 2009) and the United States (April 2009). LPAI subtype H5N2 was reported in Canada (February 2009). LPAI subtype H7N6 was reported in Japan (February to March 2009). LPAI subtype H5N3 was reported in France, Germany and Romania (February 2009).

Foot-and-mouth disease (FMD) subtype Asia 1 was reported in Bahrain (May 2009) and China (January to May 2009). FMD serotype A was reported in Bahrain (April 2009), China (January, February, April and May 2009), Lebanon (April 2009) and Kuwait (May 2009). FMD serotype O was reported in Egypt (March 2009), Lebanon (February, March and May 2009), Israel (February, March and May 2009), the United Arab Emirates (May 2009) and West Bank and Gaza Strip (February 2009). FMD SAT2 was reported in Namibia (April 2009).

African swine fever (ASF) was reported in the Russian Federation (January to May 2009).

Rift Valley fever (RVF) was reported in Madagascar (April 2009).

Bluetongue (serotype 1 and 8) continues to be reported in Europe. Serotype 6 has been reported in Germany (January 2009).

Rabies continues to be reported in Bali, Indonesia in dogs (January and March 2009).

¹ More information available at the OIE-WAHID Web site: www.oie.int/wahid-prod/public.php?page=home.

² In Hong Kong Special Administrative Region.



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