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FRESH IMPETUS TO THE ERADICATION OF MILD RINDERPEST FROM THE SOMALI ECOSYSTEM

In June 2002, FAO participated in the "Workshop on Mild Rinderpest" in Nairobi, organized by the Organization of African Unity (OAU)–Interafrican Bureau for Animal Resources (IBAR), under the auspices of the Pan African Programme for the Control of Epizootics (PACE). This meeting brought together all stakeholders to consider how to address the issue of eradicating mild rinderpest from eastern Africa. While much remains to be done to prove that other areas are free, there is growing confidence that the Somali pastoral ecosystem harbours the last reservoir of rinderpest viral activity in Africa. Political will and existing technical tools are sufficient to achieve the task of eradication (see page 3).

WORLD FOOD SUMMIT: FIVE YEARS LATER – SIDE EVENT ON EMPRES

At the 2002 World Food Summit: five years later, the side event entitled "FAO fights animal diseases and plant pests through EMPRES" was held in recognition of and echoing the Director-General's declarations made at the 1996 World Food Summit – that the pivotal constraints that transboundary animal diseases (TADs) cause on food security, sustained animal agriculture and trade be recognized. In collaboration with several national, regional and international organizations, the EMPRES programme has played an essential role in the fight against TADs (see page 8).

FAO ELECTRONIC CONFERENCE ON CONTAGIOUS BOVINE PLEUROPNEUMONIA

In June 2001, FAO finalized an electronic conference on contagious bovine pleuropneumonia (CBPP) that stimulated debate on key issues in preparation for the third FAO/Office International des Epizooties (OIE)/International Atomic Energy Agency (IAEA)/ OAU–IBAR Consultative Group meeting scheduled for 2003. The e-conference attracted participants from a number of countries, and included policy-makers, researchers, field officers, project managers and directors of veterinary services (see page 11).

This issue covers the period April to June 2002.

RINDERPEST

Current status of rinderpest in the Sudan

There is growing confidence that rinderpest has been eradicated from the Sudan in the last year. That confidence is building as time passes without any detection of rinderpest, following an active surveillance programme that exceeds anything else in place in eastern Africa. Rinderpest was last confirmed in 1998 in the south of Eastern Equatoria. The infection appeared to have come from a northeasterly direction. Data gathered subsequently in 2001 using participatory epidemiology techniques suggested strongly that the virus had been present since 1998 in animals held by the Murle and Jie tribes (in Eastern Equatoria and Jonglei). An outbreak of serious stomatitis–enteritis disease in the vicinity of Pibor in late 2000/early 2001 was identified by the pastoralists as rinderpest. Veterinary opinion was mixed and investigations attributed the disease to schistosomosis. Nevertheless, the FAO Operation Lifeline Sudan (OLS) Livestock Programme, with the concurrence of the Government of the Sudan, seized the opportunity to mount an intensive vaccination campaign intended to immunosterilize the Murle and Jie herds, which amount to nearly a million head of cattle. The strategy was agreed with IBAR–PACE and ratified by all stakeholders at an OLS North–South Coordination meeting held in Khartoum in May 2001. Despite difficulty in obtaining funding support and frank opposition from some quarters, the vaccination programme was completed successfully in these populations, which had never been effectively vaccinated previously. All rinderpest vaccination ceased at the end of June 2002 (throughout the whole of the Sudan). This withdrawal of vaccination will set the scene for serological studies to confirm the absence of rinderpest in due course. Similarly, should there be any virus persisting unnoticed, it should be visualized much easier in the susceptible population created. The use of rinderpest vaccine will be reserved for combating outbreaks should they occur.

PHOTO COURTESY OF MARC BLEICH

Cattle camp in the western upper Nile region of the Sudan

Surveillance in Eastern Equatoria and Jonglei has led to confidence that the virus has been unable to maintain itself in these populations during 2002. Events suspicious of rinderpest (i.e. stomatitis–enteritis outbreaks or any occurrence of mortality) are routinely investigated by the southern sector of OLS in partnership with the European Union (EU)-funded PACE Southern Sudan project, aptly entitled "The fight against lineage 1 rinderpest virus". Executed by OAU–IBAR through Vétérinaires sans frontières (VSF), Belgium, this project is now playing a dynamic role in southern Sudan. A system of payment for active stomatitis–enteritis clinical surveillance to be undertaken by animal health assistants and stockpersons has been developed and was launched during May and June. Each supervisor is asked to carry out two cattle camp or village visits per month, during which they examine animals for clinical signs of disease and interview a livestock keeper on the livestock situation. One investigation, still in progress in the southern sector at the end of June 2002, has caused particular concern because it occurred west of the Nile, believed to have been freed from rinderpest some years ago, in a most insecure area not far from

where rinderpest was confirmed in 1998. On 12 June 2002, a report was received suggestive of rinderpest in Lainya in Juba County. A team comprised of representatives of Vetwork Sudan Trust (a Sudanese non-governmental organization [NGO]) and OLS-South left on 18 June to investigate. On 24 June, news was received that no evidence of rinderpest had been found but East Coast fever was suspected – a highly credible diagnosis in that area. Samples were collected for confirmation. Although in the northern sector there is less evidence of active investigation (an activity that needs to be strengthened), major outbreaks are investigated. For example, rinderpest was suspected west of the Nuba Mountains earlier this year but, on investigation, it was confirmed by histopathology at Onderstepoort Veterinary Institute in South Africa to be malignant catarrhal fever.

It must be stressed that the final eradication thrust has only been possible by building on the progress made over the preceding decade through the Livestock Programme of OLS under the stewardship of the United Nations Children's Fund (UNICEF) with technical support from Tufts University, the United States of America. A major step forward has been the clearance of rinderpest from southern Eastern Equatoria by intensive vaccination coverage between 1994 and 1996. FAO assumed responsibility for the OLS Livestock Programme in late 2000.

Two areas have caused particular concern because of their inaccessibility for surveillance. The first of these – the Nuba Mountains – earlier this year became the subject of a ceasefire agreement that allowed access. The opportunity to survey for rinderpest was grasped quickly. There has been no evidence of rinderpest there for many years. The second area, of continuing concern, is the Sobat Basin, home to the Jikany and visited by groups of the Nuer and Fellata people. Evidence from neighbouring areas tends to suggest that the herds of the Sobat Basin are not harbouring rinderpest. OLS has requested a period of tranquillity to perform an active disease search, which is likely to confirm the absence of rinderpest from this population. Such periods of tranquillity, in which both sides in the conflict agree to cease fighting for a period of time, are negotiated occasionally to allow human vaccination days under the Expanded Programme on Immunization of the World Health Organization.

It will be some time before it can be certain that rinderpest has indeed been eradicated from the southern Sudanese reservoir. However, all the indications are that, after many years of effort, African lineage 1 rinderpest virus could now be extinct.

Mild rinderpest in the Somali ecosystem

Fresh impetus to the eradication of mild rinderpest from the Somali ecosystem

In 1994–95, rinderpest was detected and diagnosed in Tsavo East National Park and subsequently, in 1996, in the Nairobi National Park. Cattle from areas to the northeast of Tsavo National Park are believed to have entered the park towards the end of 1993 and transmitted the infection to wild buffaloes. This gave rise to the series of high mortalities in buffaloes, eland, lesser kudus and some other species in Tsavo from early 1994 until May 1995. Molecular biology showed that the Tsavo virus and the isolates from Nairobi National Park were genetically similar, being African lineage type 2. Isolates of this lineage had not been seen in East Africa since 1962, while it was recovered last from West Africa in 1983. This outbreak of rinderpest in wildlife revealed that there could be an area of endemic maintenance in East Africa that has remained undetected for the past 30 years and thus throughout the Joint Project 15 (JP15) campaign and the eight years of the Pan-African Rinderpest Campaign (PARC) project. The area of endemic maintenance is roughly defined as northeastern Kenya and southern Somalia.

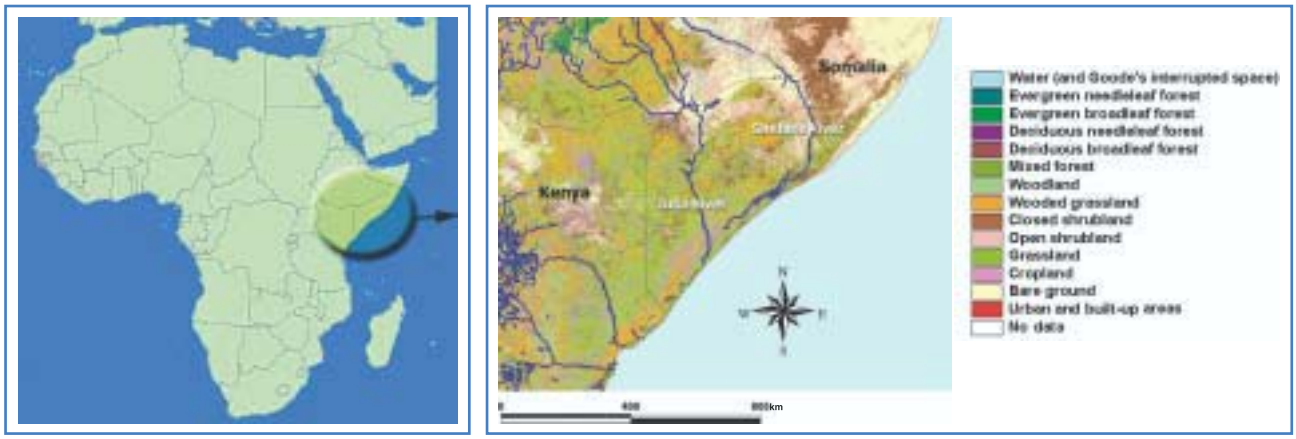
National parks in Kenya where rinderpest was detected in 1994, 1995 and 1996

Piecing together all the information available it is possible in retrospect to see a pattern of related events. In the pastoral ecosystem of northeastern Kenya–southern Somalia, rinderpest has reappeared periodically, showing a cycle of about five years:

1980–83	A moderately severe epidemic of rinderpest entered Mandera and spread to extensive areas of southern Somalia.
1985–88	A second wave of rinderpest affected the Middle and Lower Juba regions of Somalia.
1991–93	Coinciding with the onset of drought in 1991, two waves of rinderpest spread out from Wajir District, Kenya. The first, in April, travelled through Simper Fatima in central Mandera District to cause moderate mortality in Eastern Mandera District. The second wave passed Liboi, Kenya, to enter Lower Juba, causing moderate to severe mortality (30 to 70 percent) at Tabta, Bilis Qooqaani, Afmadow and Badhade in Somalia.
1994–96	Rinderpest in Mandera District persisted in a mild form. From there the disease spread to no man's land between El Wak, Kenya, and El Wak, Somalia, where it was sighted by Somali veterinary personnel in mid-1994. Subsequently, low to moderately severe outbreaks occurred in border regions on both sides of the border until the onset of the rains in early 1996. Antibodies to rinderpest were detected in Meru National Park.
Oct. 1996 Late 1995–96	A rinderpest outbreak affected eland and buffalo in Nairobi National Park. Few signs were noted in local cattle. An outbreak of rinderpest was suspected in buffaloes in Amboseli National Park Kenya (not confirmed).
Dec. 1996	After observing mild clinical disease in Maasai cattle in Kajiado, rinderpest was confirmed by the "agar gel immunodiffusion" test in cattle in South Kajiado, Kenya.

Jan.–May 1997	Outbreak of rinderpest in cattle in northern areas of the United Republic of Tanzania. It was first confirmed by the "penside" test in Ngorongoro (March 1997) and Loliondo (April 1997).
1998–99	Clinically mild cases of rinderpest were detected in several locations in Afmadow District. None was clinically confirmed.
Oct.–Nov. 2001	Lineage 2 type rinderpest was detected and confirmed in buffaloes from the Meru National Park.

In Somalia, the area of endemic maintenance of African lineage 2 rinderpest virus has been considered to be confined to the area south of the Juba River. Serosurvey work done over the past years shows the presence of antibodies in unvaccinated stock as far as central Somalia.



Land cover classification in the Horn of Africa (Maryland – 1 km resolution)

In order to consider how to address the issue of eradicating mild rinderpest from Eastern Africa, a workshop on mild rinderpest was organized by OAU–IBAR under the auspices of PACE and held in Nairobi from 17 to 19 June 2002. This meeting, in which FAO participated, brought together all concerned stakeholders.

There is growing confidence that the Somali pastoral ecosystem harbours the last reservoir of rinderpest viral activity

While much remains to be done to prove that other areas are free, there is growing confidence that the Somali pastoral ecosystem harbours the last reservoir of rinderpest viral activity in Africa. Although the political will and existing technical tools are sufficient, initially doubts were raised about interest in its eradication. However, the countries involved in the endemic maintenance reaffirmed their commitment to the eradication of the rinderpest virus as it was perceived that mild rinderpest could revert to a more virulent form. It was agreed that the basic strategy is one of "seek, contain, eliminate and verify" – in other words, surveillance should identify the areas of endemic maintenance and, within these areas, the foci of active disease transmission. The surveillance tools include participatory epidemiology and wildlife surveillance. Focused vaccination campaigns would be used to immunosterilize these foci, if needed. If other tools become available, offering advantages over those in use, they will be applied to the work.

RECOMMENDATIONS OF THE WORKSHOP ON MILD RINDERPEST (JUNE 2002)

Overall strategy

Recognizing,

1. that the persistence of rinderpest in the Somali ecosystem threatens PACE's stated commitment to the eradication of rinderpest and the deadline of 2010 of the Global Rinderpest Eradication Programme (GREP) for verified freedom from rinderpest infection;
2. that there is growing confidence that the Somali ecosystem represents the last reservoir of rinderpest in Africa and one of the last two in the world and that the political will and existing technical tools are sufficient to do the job;
3. that the eradication of mild rinderpest from the Somali ecosystem (and protection of at-risk areas e.g. Maasailand) requires an effective, comprehensive and harmonized regional surveillance system that utilizes a complementary set of participatory, laboratory-based and analytical epidemiological tools, with appropriate vaccination (immunosterilization) of threatened cattle populations.

It is recommended that:

- the objective of surveillance should be the identification of areas where active infection is current primarily through active disease searching supported by serosurveillance;
- once the disease is confirmed or, where there is a high index of suspicion, rapid and intensive as well as targeted vaccination of the cattle population concerned should be undertaken to achieve immunosterilization;
- all institutions should be encouraged to contribute in their area of expertise, especially with reference to participatory disease searching, wildlife surveillance and modelling of disease transmission in order to improve the predictive capacity of the veterinary departments and improve the chances of finding and eliminating foci of the virus;
- PACE Common Services endeavour to train veterinary professionals and ancillary staff in the practical aspects of participatory epidemiology in Ethiopia, Kenya and Somalia, followed by coordinated application with frequent follow-up workshops and coordination meetings in key border locations;
- FAO strengthens its collaboration with IBAR to focus additional resources on practical implementation of the time-bound eradication programme.

Wildlife and rinderpest

Recognizing,

1. that rinderpest disease search and serosurveillance of wildlife populations has provided most of the data on the epidemiology of lineage 2 rinderpest virus in the Somali ecosystem;

2. the role of wildlife as a vector of the disease and the importance of the livestock/wildlife interface.

It is recommended that:

- Regular and frequent monitoring of wildlife populations in the Somali ecosystem and adjacent areas for rinderpest infection be undertaken, in particular in areas near the interface between wildlife and livestock.
- Increased support be provided to the regional reference laboratory for further study of the biology of lineage 2 rinderpest virus.
- The capacity in the region to deal with wildlife disease issues needs to be improved through training and establishment of qualified persons in the appropriate sectors, i.e. animal health and wildlife.

Laboratory diagnosis, molecular epidemiology and serological testing

Considering the apparent difficulty in obtaining confirmatory diagnosis of mild rinderpest in cattle and the need for early diagnosis in the field (as well as certification for the absence of rinderpest infection) the ongoing serosurveillance exercise under PACE is vital for the final eradication of rinderpest.

It is recommended that:

- A manual of recommended samples, procedures and tests for rinderpest, including infection with mild strains, is produced and circulated to all appropriate authorities by October 2002.
- National and regional laboratories participating in PACE are furnished with the resources essential for prompt testing of samples in accordance with the serological test strategy incorporating tests that are sensitive, specific and validated for all rinderpest and peste des petits ruminants lineages.
- Research continue to develop serological tests that are able to differentiate vaccinated from infected animals as well as serological tests for early detection of virus infection and lineage identification.

Vaccines and their role in the eradication control of rinderpest

Recognizing the need to eliminate the remaining foci of infection in the Somali ecosystem through vaccination,

It is recommended that:

- licensed vaccines that enable the differentiation of vaccinated animals from those that are naturally infected be made available as soon as possible. Therefore, data on the availability, safety, efficacy and cost of recombinant and other new generation vaccines should be made available to facilitate informed decisions by PACE-member countries.

WORLD FOOD SUMMIT: FIVE YEARS LATER – SIDE EVENT "FAO FIGHTS ANIMAL DISEASES AND PLANT PESTS THROUGH EMPRES"

At the 1996 World Food Summit, the pivotal constraining threat of transboundary animal diseases and plant pests to food security, sustained animal agriculture and trade was recognized. This led the Heads of States and Governments to conclude with a pledge, stated in Commitment No. 3: "*Seek to ensure effective prevention and progressive control of plant and animal pests and diseases, including especially those which are of transboundary nature, such as rinderpest, cattle tick, foot-and-mouth disease and desert locust ...*".

FAO is considered to have a comparative institutional advantage in coordinating the management of transboundary animal and plant pests and diseases because such management usually requires collaborative actions between countries if success is to be achieved. The EMPRES programme has been developed by two technical services at FAO – the Plant Protection Service (AGPP) for plant pests and the Animal Health Service (AGAH) for animal diseases. Although they share some approaches, they deal with different problems.

EMPRES-Desert Locust

The EMPRES programme on plant pests was initiated in 1994 with a component specifically aimed at the desert locust (*Schistocerca gregaria*). The desert locust has been a scourge of humanity for at least two millennia. When a plague occurs, crops and pastureland in up to 65 countries in Africa, the Arabian Peninsula and southwest Asia can be threatened. Plagues develop in desert and semi-arid areas where poor subsistence farmers are the first to be affected.

EMPRES-Desert Locust was designed as a long-term collaborative programme among locust-affected countries, donors and FAO. Emphasis is given to strengthening the capacity of national units to carry out preventive control through early warning, early reaction and research. The programme focuses on three regions: western (west and northwest Africa), central (Red Sea area) and eastern (southwest Asia).

Furthermore, EMPRES' experience has enriched FAO's approach to emergencies caused by other species of locust. In Afghanistan, the current locust emergency will lead to a medium-term approach, also covering several other countries in the region, employing a preventive strategy to reduce the risk of future emergencies and using, where possible, biopesticides. Despite these achievements, much remains to be done to ensure that new methodologies and technologies for preventive control function during upsurges and are sustainable.

EMPRES-Livestock

EMPRES-Livestock works through the promotion of four key precepts: e*arly warning, early reaction, coordination* and *enabling research*. With the recent outbreaks of foot-and-mouth disease (FMD) in Europe, South America, southern Africa and Asia, of classical swine fever in Europe, and of Rift Valley fever in Eastern Africa and the Arabian Peninsula, early warning systems and rapid detection are key to combating disease in an efficient and cost-effective manner. EMPRES, through information networks and collabo-

rative partners, receives and analyses global data and patterns, and disseminates early warning messages to all countries. The actions of countries depend on the level of emergency preparedness to face or limit the entry of a crippling disease into their territory. In this regard, EMPRES has written basic contingency manuals on African swine fever and CBPP and is finalizing manuals on Rift Valley fever and FMD. A disease database management system, TAD*info* (transboundary animal disease information system) has been developed to assist countries in animal health management and analysis; the national databases, when shared and linked with neighbouring countries, serve as a regional TAD*info* for providing decision support at the regional level. EMPRES has recently launched EMPRES-***i*** *(pronounced EMPRES-eye; for information, intelligence, intervention)*, as a new global early warning information system with informational links for animal diseases, animal health and the environment (see page 15).

Of the 16 major TADs, EMPRES has given primary attention to rinderpest, FMD, CBPP, classical and African swine fevers, peste des petits ruminants, Rift Valley fever and Newcastle disease of poultry.

The major achievements of EMPRES-Livestock include:

- Initiation of the Global Rinderpest Eradication Programme (GREP), an integral part of EMPRES, which has been instrumental in reducing this once devastating disease, responsible for millions of deaths in livestock and wildlife throughout Europe, Asia and Africa, to a few small circumscribed areas of the earth. It is expected that, in the next few years, these last foci will also be eradicated, and a process of declaring freedom from rinderpest, country by country, region by region, will begin.
- Eradication of African swine in Côte d'Ivoire and Ghana (2000–2001).
- Eradication of a new FMD virus introduction in North Africa (1999).
- Launching of the Hemispheric Plan for the Control and Eradication of Classical Swine Fever in the Americas, with the objectives of eliminating this disease by the year 2020 and providing a framework for other regions of the world to do the same.
- Participation of over 3 000 animal health professionals and allied technicians in courses and workshops since 1994.

Additional accomplishments of EMPRES-Livestock include:

- Deployment of TAD*info* to 40 countries, 12 of which use it fully. An additional eight countries are having their applications processed.
- Assistance in the form of technical expertise, laboratory proficiency or disease control methods has helped numerous countries throughout the world keep African swine fever, FMD, Rift Valley fever and CBPP at bay. Such efforts require solid veterinary and animal production linkages to the field and robust information networks, which, lamentably, are lacking or are deteriorating rapidly in many regions.

Although EMPRES is not a research facility, the analytical activities are of utmost importance for a better understanding of disease patterns and intervention strategies. Furthermore, EMPRES as an entity stimulates, assists and maintains valuable inputs to guide research as needed in the member countries, provides support to reference laboratories for the diagnosis of TADs and collaborates extensively with IAEA and university centres worldwide.

During the World Food Summit: five years later, in June 2002, EMPRES was invited to conduct a special side event opened by the Minister of Agriculture from Namibia and, as a special guest, the Minister of Agriculture from Japan. The event, which was particularly well attended, called for a Global Plan of Action against FMD.

The Declaration of the World Food Summit: five years later focused four of the 35 commitments on TADs and animal health (see box, page 10, available at www.fao.org/docrep/meeting/004/Y6948E.html).

EXTRACTS FROM THE DECLARATION OF THE WORLD FOOD SUMMIT: FIVE YEARS LATER

Para. 16. We reaffirm the important role of Codex Alimentarius, the International Plant Protection Convention (IPPC) and the Office International des Epizooties (OIE) to provide effective, science-based, internationally accepted standards of food safety, plant and animal health, as well as to facilitate international food and agricultural trade in their role as the WTO [World Trade Organization] Agreement on Sanitary and Phytosanitary Measures (SPS)-recognized standard-setting bodies.

Para. 17. We pledge to continue to support efforts to strengthen developing countries' capacity with respect to the management of food safety and plant and animal health.

Para. 20. We resolve to contribute to the outcome of the World Summit on Sustainable Development, recognizing the important role of the three Rome-based organizations, FAO, WFP [World Food Programme] and the International Fund for Agricultural Development (IFAD), and to strengthen coordination and cooperation among national and international organizations, in order to make efficient use of resources, particularly in the areas of technical and financial cooperation, sustainable management of natural resources, fighting transboundary animal and plant diseases and securing food safety.

Para. 27. We call on all member countries, intergovernmental and non-governmental organizations, the private sector and all other partners in development to consider voluntary contributions to the FAO Trust Fund for Food Security and Food Safety and other voluntary instruments. The Trust Fund should serve as a catalyst for accelerating food production and improving food access in LDC [least developed countries], LIFDC [low-income food-deficit countries] and small island developing states, and for the prevention, control and eradication of transboundary pests and plant and animal diseases, and the preparation of investment projects, and south–south cooperation, in the aforementioned areas.

CONTAGIOUS BOVINE PLEUROPNEUMONIA

Proceedings of FAO electronic conference on CBPP

In June 2001, FAO finalized an electronic conference on CBPP that stimulated debate on key issues in preparation for the third FAO/OIE/IAEA/OAU–IBAR Consultative Group meeting scheduled for 2003. The e-conference attracted many participants, including policy-makers, researchers, field officers, project managers and directors of veterinary services. The issues raised during the conference were:

- Public versus private good in CBPP control
- Research in the pathogenesis of CBPP: vaccines and diagnostics
- Use of antibiotics in CBPP control
- Strengthening veterinary services
- Economic impact assessment of CBPP
- Use of Hazard Analysis and Critical Control Point (HACCP) system principles in CBPP management
- The future for CBPP control

Public versus private good in CBPP control

The majority of the participants expressed the opinion that the control of CBPP should be considered more of a public than a private good and, as such, should still remain within the public domain. In this regard, effective coordination of research, maintenance of disease-free areas, support for the development of better tools and information systems, and the establishment of an enabling environment, were all considered as public goods. However, although opportunities for synergy between the private and public sectors in the control of CBPP exist, these must be carefully planned to ensure continued mutual advantage.

Research in the pathogenesis of CBPP: vaccines and diagnostics

Repeated vaccination with T1 44 could be sufficient to reduce disease incidence in national herds. Although it is essential that six-monthly vaccination be carried out, unfortunately this is not happening in most countries, and explains the negative attitude towards vaccines.

Reference was made in the e-conference to the success that many countries have registered in the past in their fight against CBPP, using simple tools such as movement control and effective compensation to farmers after stamping out. These countries, though then lacking any clear understanding of the pathogenesis and immunology of the disease; had, however, what mattered – a coherent political will and the right legislative framework.

In the light of the above, it was suggested that control measures against CBPP in African countries should be implemented without further delay, with regular review where necessary. “We do not have to wait until all the basic immunological events occurring in affected cattle are clearly understood,” was how one participant summed it up.

At the same time, it was also observed that the development of a new generation of CBPP vaccines has been slow. Attempts to improve vaccine efficacy, ranging from the modification of streptomycin resistant strain T1 SR to the recent immunostimulating complex (ISCOM) preparations, have not been completely successful either. This suggests that empirical vaccine preparation without prior knowledge of the protective antigenic

DEPARTMENT OF ANIMAL HEALTH AND PRODUCTION, BOTSWANA

CBPP affected cattle showing difficulty in breathing. They stand with head and neck extended and legs widely placed. Often the elbows are turned out. Inflammation of the membranes surrounding the lungs and fluid in the thorax cause pain in the chest resulting in abdominal and exaggerated breathing movements.

components of the causative organism of CBPP, *Mycoplasma mycoides* subspecies *mycoides* Small Colony type (*Mmm*SC), is fraught with risks.

The establishment of improved diagnostic reagents would have to rely heavily on the results of immunological studies and genome analysis to facilitate identification of carriers.

New tools would have to be developed to detect chronic carriers and smarter, more reliable tools would be required to switch from the present herd-based diagnosis to individual diagnosis. At the same time, more and better funding from international and national research organizations is required.

Coordination was deemed essential to the timely success of research efforts, and the FAO/IAEA Coordination Research Programme on the Diagnosis and Control of Contagious Bovine Pleuropneumonia in Africa provides a forum for dialogue among stakeholders. It is a link between the various activities of PACE and regional FAO CBPP programmes.

Use of antibiotics in CBPP control

There was a strong perception that the use of antibiotics at least predisposes or may cause infected animals to become chronic carriers of CBPP. There is little information on the effect of treatment on the generation of carriers, and on the role of carriers in the spread of the disease. Various reasons were stated why the use of antibiotics is not currently recommended for CBPP. These include:

- It causes much tissue damage in CBPP, since an effective concentration of the antibiotics, lethal to *Mmm*SC, is difficult to reach at the site of actual infection.
- Tetracyclines are bacteriostatic not bactericidal, with the host eventually killing and eliminating the mycoplasmas.
- The pathology of CBPP found in Botswana was different to that of the one in East Africa. In Botswana, sequestra were found to be liquid, generally without capsula-

tion, and this was thought to be caused by antibiotics. However, comments from other participants in the electronic conference suggested that the liquefied lesions observed in Botswana might be a stage in the progressive development of sequestra. Similar lesions were also observed in experimental vaccine studies in Cameroon.

The importance of research on treatment to ascertain which antibiotics may be useful and the field situations that would warrant their use, validation of regimes and documentation of any adverse effects was recognized and should be accorded a high priority. Money invested in determining the true efficacy and risks of treatment would probably be of most direct benefit to farmers, given the reality of what is happening in the field, where farmers use antibiotics nonetheless.

Strengthening veterinary services

Without an effective veterinary service to underpin surveillance, movement control, vaccination strategies and other control measures, there is little prospect of a progressive control of the disease. Pastoral communities should be co-opted in the control of CBPP, by enhancing their own traditional coping mechanisms such as self-imposed quarantine of infected cattle for a realistic period of time. However, to gain pastoralists' confidence and cooperation would also entail explaining to them the rational basis for disease control protocols.

Economic impact assessment of CBPP

Several participants stressed the importance of CBPP impact assessment studies, and observed that quite often governments' and bureaucrats' negative attitudes towards CBPP control stem from the fact that the full impact of the disease is not fully known and appreciated. It was considered that the baseline data necessary to effect such economic impact studies would have to be generated by the national veterinary services, through their epidemiology networks or units.

Use of HACCP principles in CBPP management

The importance of HACCP principles in CBPP management was also stressed, particularly in consideration of the scarce or dwindling resources available for disease control. Furthermore, it was suggested that a HACCP plan could be developed for a particular locality based on the epidemiology of the disease present in that locality.

The future for CBPP control

Insufficient funding of national veterinary services in Africa was identified as one of the reasons leading to a marked deterioration of the disease status in the continent. The lack of close surveillance almost certainly means that the extent of the disease is not fully realized. Currently, there is a decrease in the number of infected foci in Namibia but, at the same time, there are increasing incursions of the disease into Zambia from Angola. Solutions such as cattle movement control are usually not practicable in many parts of the continent, and this clearly contributes to the spread of the disease. Transhumance, drought and culture often complicate this situation further.

Any plan for CBPP control must be systematic and viewed in terms of regions, because the measures taken by any country have a direct bearing on the disease status of neighbouring countries.

It is hoped that the regional recognition of CBPP status would prompt concerted efforts to: coordinate resource management; realize an accurate description of the spread of CBPP through the enhancement of field and laboratory surveillance; realize active population sensitization; and promote dissemination of relevant information.

The consequences of CBPP are devastating, and efforts must be made to assess its impact, through cost–benefit analyses of various control measures. The issue should be brought to the attention of national Ministries of Agriculture in appropriate regional forums and at national levels through PACE national activities.

Finally, the control of CBPP requires political will, which must be built before the necessary legislative back-up is provided.

Source: Contagious bovine pleuropneumonia – to eradicate, control or live with the disease. FAO June–November 2001, available at www.fao.org/ag/AGA/AGAH/EMPRES/info/CBPP/CBPPe-conf.vb.htm

INFORMATION SYSTEMS

EMPRES-*i* (information, intelligence, intervention)

... designed to support national veterinary epidemiologists and facilitate regional and global information sharing and collaboration on the progressive control and eradication of major TADs

The newly developed EMPRES Global Animal Disease Information System (EMPRES-***i***) is a Web-based application that has been designed to support national veterinary epidemiologists and facilitate regional and global information sharing and collaboration on the progressive control and eradication of major TADs. EMPRES-***i*** provides updated information on global animal disease distribution, current threats and response to emergencies. It also provides access to training materials and resources for veterinary epidemiologists.

The EMPRES-***i*** concept is an EMPRES initiative, conceived in response to the growing demand of users for a model, one-touch disease information gathering and sharing formula. The system is currently under development and when fully operational will accommodate the following features:

- **A gateway to animal health information systems throughout the world.** EMPRES-***i*** will enable end-users easy access and retrieval of information on animal diseases throughout the world. It will offer a gateway to international, regional and national information and early warning systems, and also provide access to other sites of interest.
- **Risk mapping for EMPRES priority diseases.** In close collaboration with FAO geographic information systems (GIS) and remote sensing units and other collaborative centres specialized in GIS applied to veterinary epidemiology, EMPRES-***i*** will provide disease prediction models and disease risk maps that will be useful tools for epidemiologists and decision-makers in the management of disease surveillance activities and the definition of disease control programmes. This mapping component will focus on those diseases identified by international or regional consensus as high priority and will be more specifically targeted on diseases for which EMPRES coordinates a specific programme, such as the GREP, or other priority diseases. Relevant links to other GIS applications dealing with animal health will also be included.
- **Disease alerts and response.** Although EMPRES already uses official and unofficial sources of information (such as in-country assistance projects and personal contacts with NGOs and other institutions) to maintain a good level of awareness on priority diseases, a specific disease intelligence system will be developed within EMPRES-***i*** to enhance EMPRES capacity to deal with early warning. It will be used to generate and disseminate early warning messages and to adopt appropriate response actions.
- **Forecasting major epizootics.** While the possibility of developing models for specific diseases will be investigated, a more general approach to prevent the occurrence of disease disaster will be adopted. This will be done through the collection and analysis of risk indicators identified against their potential impact (direct or indirect) on disease occurrence and spread. As an example, the monitoring of climatic parameters indicative of drought, floods or other natural or human-induced disasters could help to understand the movement of animals and people with a subsequent impact on the spread of animal diseases. Once prioritized according to their relevance and impact on specific diseases, the following parameters could be monitored at a global level:

– climatic indicators
– displacement of people/refugees in areas of civil unrest
– livestock trade routes/patterns and changes; transhumance patterns
– human-induced changes to the environment (irrigation schemes, dam construction, deforestation)
– location of check-points/quarantine points/holding grounds
– livestock and commodity market price fluctuations
– major feast periods (e.g. the Hadj in Saudi Arabia)

The main objective of such a system would not necessarily be to provide an accurate prediction of disease epizootics but rather to highlight areas or regions where targeted surveillance should be implemented.

- **Disease recognition.** Effective control of an outbreak is often directly proportional to the speed with which it is reported. Hence it is critical to be able to recognize and diagnose major TADs. To help in disease recognition, training materials produced by EMPRES and other centres of excellence will be available online under the disease recognition module of EMPRES-***i*** for veterinarians and technicians who wish to improve their knowledge and understanding of the epidemiology of TADs.

Further information on EMPRES-***i*** is available at the new EMPRES Web site at www.fao.org/empres

TAD*info* deployment in Amman, Jordan

TAD*info* has been deployed in the Animal Health and Epidemiology Section of the Veterinary Service in Amman, Jordan. Four veterinarians and three technicians participated in training on the TAD*info* Animal Disease Information System, covering demonstrations and training on the TAD*info* modules of disease, survey and abattoir observations; vaccinations; livestock census and system configuration.

Disease data from the daily clinic book, derived from passive surveillance, were entered into the TAD*info* database. The veterinarians expressed interest in the use of TAD*info* for storing and managing animal health information. TAD*info* and GIS training manuals, together with a CD-ROM of presentations on animal health information systems, disease surveillance and examples of disease report forms, were given to the Epidemiology Unit. Data entry and data analysis officers, and a computer company that will deal with computer trouble-shooting, were identified.

PHOTO COURTESY OF LEDI PITE/EMPRES

Veterinarians during TAD* info *training in Amman

WORKSHOPS

Epidemiology and training workshop in Tirana, Albania

The Balkan countries are situated in a strategically important region of Southern/Eastern Europe. They are in the first line of defence against transboundary animal disease that may invade Western Europe from the Middle East and Asia. During the last decade, political changes, several wars, civil strife and natural disasters such as floods, earthquakes and TAD epidemics have heavily affected the area. Alarming outbreaks of TADs have recently occurred in the region, including outbreaks of FMD, classical swine fever and bluetongue.

The control of major infectious animal diseases is a high priority for the veterinary services of those countries, although the impact of economic reform has left most of the veterinary services weakened and struggling with regard to disease control and other animal health issues. The project "Emergency Control of Transboundary Diseases of Livestock in Southern and Eastern Europe" (TCP/RER/0066) is contributing to strengthening the national and regional capacities to respond to TAD emergencies through technology transfer in the fields of diagnostics, epidemiology and emergency preparedness. However, the application of modern diagnostic methods for disease surveillance, early warning, early reaction and research are only possible if veterinary services and other relevant parties are conversant with modern veterinary epidemiology and data management principles.

Consequently, from 11 to 15 March 2002, FAO organized in Tirana, the capital city, a training workshop on epidemiology and TAD *info*. Prof. Kris Wojciechowski, Drs Valdir Welte and Sinan Aktaş jointly chaired the workshop, with input for the technical sessions by Drs Rupert Holmes, Ledi Pite and John Ryan. Two representatives from countries participating in the project attended the workshop.

An introduction to the FAO-EMPRES programme was presented to participants with emphasis on early warning and good emergency management practices (GEMP). Technical sessions, focusing primarily on disease surveillance, animal health information systems, applied epidemiology and data analysis were held, and the need for more active methods of disease surveillance was stressed. The activities of the European Commission

PHOTO COURTESY OF LEDI PITE/EMPRES

Participants of the epidemiology workshop in Tirana

PHOTO COURTESY OF LEDI PITE/EMPRES

The workshop participants from Iraq, Jordan, the Syrian Arab Republic and Turkey and the FAO facilitators

for the Control of Foot-and-Mouth Disease (EUFMD) and an overview of the global FMD situation were presented. In addition, the recent activities of the Joint FAO/IAEA Division (Animal Production and Health Subprogramme) were presented and discussed, and a presentation on behalf of OIE was also given, highlighting new activities with regard to animal disease information. An intensive practical training session in TAD*info* software was given to the participants, covering data entry, data analysis, basic GIS skills and customization for all modules within the software.

The activities and functions of the Veterinary Biotechnology and Epidemiology Network for Central and Eastern Europe (CENTAUR – http://centaur.vri.cz/), established by FAO, were addressed. The network has proved to be an important forum for the exchange of information on surveillance and the control of the major diseases in the region. The Centaur Newsflash electronic bulletin continues to be distributed on a regular basis to all subscribers.

Contingency plans and emergency preparedness workshop in Damascus, Syrian Arab Republic

An international workshop on contingency plans, emergency preparedness and control of transboundary animal diseases was held in Damascus, Syrian Arab Republic, from 4 to 8 November 2001, under the aegis of the technical cooperation project TCP/SYR/0065. Participants were drawn from Iraq, Jordan, the Syrian Arab Republic and Turkey. The major component of the workshop was to assess and strengthen emergency preparedness against the introduction of an exotic disease into one of the countries in the region.

The lecture topics were concentrated on the needs, structures and creation of realistic, workable and sustainable contingency plans in the region. The workshop facilitated the preparation of a draft "Contingency Plan for Rinderpest" for each country.

COMMUNICATIONS

A perspective on the 2001 *Mycoplasma mycoides* subsp. *mycoides* Large Colony occurrence in New Zealand

Introduction

The phylogenetic relationship between *Mycoplasma mycoides* subsp. *mycoides* Small Colony (*Mmm*SC), causative agent of contagious bovine pleuropneumonia (CBPP), and the other members of the M. *mycoides* cluster, especially *Mycoplasma mycoides* subsp. *mycoides* Large Colony (*Mmm*LC) and *M. mycoides* subsp. *capri* (*Mmc*), has always generated interest among the veterinary scientific community. This interest was further stimulated to the point of concern by the occurrence of *Mmm*LC in goats and calves in New Zealand in 2001, reported through a declaration to the OIE on 5 November 2001. This presentation by the International Cooperation Centre on Agrarian Research for Development (CIRAD) is prompted by the need to give an update on these issues, which may not be familiar to colleagues working in countries where CBPP is considered an exotic disease and/or in countries where dairy goat production may not be important.

Findings on M. mycoides *cluster*

Researchers G. Cottew and F. Yeats (1978) provided a distinction between the two *M. mycoides* types, based on growth characteristics (much faster for *Mmm*LC); survival at 45 degrees centigrade (much higher for *Mmm*LC) or casein digestion (much higher for *Mmm*LC).

A further classification of the *M. mycoides* cluster was given in 1987 (Cottew *et al.*, 1987). Two subgroups were clearly identified: capricolum (consisting of *M. capricolum* type F38 and Leach's serogroup 7) and mycoides (*Mmm*SC, *Mmm*LC and *Mmc*). Since 1987, newer laboratory techniques such as polymerase chain reaction (PCR), by facilitating the specific identification of *Mmm*SC, have enabled a clearer distinction between *Mmm*SC and *Mmm*LC (Dedieu *et al.*, 1994; Bashiruddin *et al.*, 1994). To examine the *M. mycoides* cluster further, a phylogenetic study of the cluster was elaborated through the systematic sequencing of an intergenic DNA sequence (Thiaucourt *et al.*, 2000). The results showed a good agreement with the conventional classification used for *M. mycoides* cluster in two subgroups. Furthermore, they showed that *Mmm*LC and *Mmc* should be considered as a single entity.

From a more practical standpoint, this means that the isolation of *Mmm*LC strains in a CBPP-free country, as was the case with New Zealand, should *not* be considered as a major threat to cattle. Yet, in a more distant perspective, analysing the phylogenetic relations of a number of *Mmm*LC strains collected worldwide could be quite interesting, since many authors have shown that the mycoides group is heterogeneous. For example, the origin of the *Mmm*SC specific Insertion Element (IS 1634) certainly merits attention in order to understand how *Mmm*SC strains acquired it. It could originate from a particular group of yet unidentified *Mmm*LC strains or through a lateral DNA exchange with a phylogenetically more distant bacteria.

Goats as hosts of M. mycoides *cluster*

Goats seem to be the natural hosts of mycoplasmas of the *M. mycoides* cluster. Various authors (Cottew and Yeats, 1978; DaMassa and Brooks, 1991) have shown that these bacteria could be isolated from the ear canal of goats without symptoms of an ear infection, or from parasites colonizing the ear canal. These mycoplasma strains are indistinguishable from those that are isolated from pathogenic events in goat herds, suggesting that there may be some kind of an ecological niche where they survive. It also suggests that additional factors could explain why they become pathogenic at some point.

Mycoplasma strains of the *M. mycoides* cluster cause disease symptoms that resemble "contagious agalactia", with mastitis, arthritis and keratitis constituting the prominent features in adults with pneumonia and septicaemia common in kids. (Thiaucourt *et al.* 1996). This resemblance to the contagious agalactia syndrome caused by *M. agalactiae* is certainly due to an evolutionary convergence and not to a phylogenetic proximity, as *M. agalactiae* differs widely from the members of the *M. mycoides* cluster.

Indications for future study

Practically, the serological or genetic tools to identify *M. agalactiae* are very specific and should not lead to cross-reactions with members of the *M. mycoides* cluster. This should constitute an interesting point of reflection that could lead to the recognition/identification of *M. agalactiae* as the sole etiological agent of "contagious agalactia". In conclusion, it is quite likely that a systematic search of mycoplasmas in goats will lead to numerous isolations anywhere in the world even if no disease occurs. The normal hosting of mycoplasmas in the ear canal without any detectable seroconversion may lead to difficulties in defining ways to implement sound control strategies.

Mycoplasma mycoides *subsp.* mycoides *in New Zealand*

An outbreak of polyarthritis due to *Mycoplasma mycoides* subsp. *mycoides* (Large Colony) (*Mmm*LC) occurred in November 2001 in goats and very young calves. In unusual circumstances, the calves were fed milk from infected goats. As a precaution, all calves exposed to the infected milk were slaughtered or held under containment for research purposes, in particular to determine whether horizontal transmission between cattle could occur. Investigations during the outbreak revealed that *Mmm*LC had been present in New Zealand dairy goats for some years without causing significant disease outbreaks. *M. agalactiae* has never been isolated in New Zealand. (*For further information, see* OIE Disease Information, 17 May 2002, Vol. 15, No. 20, available at www.oie.int, online publications.)

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Contribution from the FAO collaborative centre, International Cooperation Centre on Agrarian Research for Development, Animal Production and Veterinary Medicine (CIRAD–EMVT).

NEWS

Farewell to Mark Rweyemamu

Dr Samuel Jutzi, Director of the FAO Animal Health and Production Division, joined colleagues and friends in wishing Dr Mark Rweyemamu well in his future engagements, after a meritorious service with the Organization. The Director's thank-you message was delivered during a farewell party organized last December in honour of Dr Rweyemamu, who retired from FAO as Senior Officer, Infectious Diseases Group-EMPRES. He recalled Rweyemamu's pioneer role in the realization of the EMPRES idea – developing and building the EMPRES concept into the institution it has become today – and for bringing EMPRES onto the centre stage of FAO activities.

PHOTO COURTESY OF LEDI PITE/ EMPRES

Dr Mark Rweyemamu and his wife, Francisca, receiving the EMPRES medal from the Director during the farewell party

A brief profile of Dr Mark Rweyemamu

Tanzanian-born Dr Mark Rweyemamu, a one-time university lecturer, started his long rewarding career in 1969, first as a Virologist at the Central Veterinary Laboratory, Temeke, Dar es Salaam, and later as Chief Research Officer, coordinating research in livestock production and health. During this period he also represented the Tanzanian Government on various occasions. He then became Head of the Virus Diseases Division of the East African Research Organization based in Nairobi, Kenya, followed by employment with the London-based Wellcome Foundation. During his career at the Wellcome Foundation, Dr Rweyemamu was Senior Scientist, Deputy Head and Head of its FMD Research and Quality Assurance Department, positions that offered him the opportunity of a stake in the strategic planning and evaluation of biotechnology in future vaccine technologies. During this period, he coordinated Wellcome's FMD vaccine research and development programme at Pirbright, UK, and was also involved in the vaccine trial runs at laboratories in a number of countries including Argentina, Brazil, Germany and Kenya. From 1983 to 1989, he worked for Pfizer Inc., Brazil, on the evaluation of biotechnology claims, and was responsible for the research programme on vaccines.

While at FAO, he has been involved in livestock policy issues and activities at EMPRES including:

- conceptualization of the EMPRES programme;
- strengthening of GREP activities;
- development of TAD*info*, the GIS-based disease support software, and multimedia programmes for Good Emergency Management Practices in animal health.

He holds a Bachelor of Veterinary Science and Ph.D. degrees from the University of Bristol, United Kingdom, with over 90 scientific papers to his credit, and has held many international appointments, including as a member of the UN Secretary-General's Special Envoy Team in the Horn of Africa in 2000.

The *EMPRES Bulletin* editor and the entire staff of the FAO EMPRES group thank Dr Rweyemamu and wish him well in his future undertakings.

A new look for the EMPRES Web site

The EMPRES Web site is an essential point of contact and link for up-to-date information on TADs. It is a service tool designed specifically to pursue the further improvement of animal health through enhancing the surveillance and control of major TADs. The home page has now been enriched with a new design; there are more subject-pages and related links, offering users more navigation options. Comments and suggestions from users are most welcome. EMPRES URL: www.fao.org/ag/AGA/AGAH/EMPRES/index.htm

In brief ….

Since the last edition of the *EMPRES Bulletin* (No. 20/1–2002), there have been confirmed occurrences of the following livestock diseases around the globe as reported by the OIE and highlighted by the EMPRES early warning messages:

- Bovine spongiform encephalopathy (BSE), otherwise known as "mad cow disease", was confirmed through laboratory test in Malopolska ("Little Poland"), southern Province of Poland on 2 May 2002 and on a dairy farm in Hokkaido Prefecture, Japan, on 13 May. On 4 June, the disease was also confirmed in a farm establishment in Israel. These outbreaks represent the first occurrences of the disease in Poland and Israel, and the fourth in Japan.
- A suspected case of Newcastle disease in a poultry layer farm in Australia's Western Victoria Province was reported on 10 May 2002 by the Department of Agriculture, Fisheries and Forestry (AFFA) and sample tests conducted were positive. In June, outbreaks of the disease in Japan (Kagawa Prefecture) and in Venezuela (Zulia State) were announced by their respective veterinary authorities.
- On 7 May, the Spanish authorities confirmed an outbreak of classical swine fever (CSF) in a pig holding in Cataluña. On 15 and 16 May, the disease was also reported on small, fattening pig farms in Bulgaria, representing the twenty-fourth and twenty-fifth CSF outbreaks in the country since the end of March. The disease was also reported in Slovenia and France on 11 March and 29 April 2002, respectively, and in Croatia, Luxembourg and Costa Rica in June.
- On 7 May, a suspected case of FMD was detected in Zambia (Mbala district) and, on 21 May, 69 new suspected cases were reported in the same area, as announced by the country's veterinary authorities. (Editor's note: At the time of this publication, confirmatory results were not available.)
- On 4 May 2002, two outbreaks of FMD were confirmed in the Republic of Korea. The virus type was FMD virus type O1 (Pan-Asian topotype).

Full reports can be obtained from the OIE Web site: www.oie.int/

CONTRIBUTIONS FROM FAO REFERENCE LABORATORIES AND COLLABORATING CENTRES

FAO/OIE World Reference Laboratory for FMD, Pirbright, UK
Report for January to March 2002

Country	No. of samples	FMD virus serotypes							SVD virus[1]	NVD[2]
		O	A	C	SAT 1	SAT 2	SAT 3	ASIA 1		
Bhutan	39	20	0	0	0	0	0	4	0	15
Botswana	28	0	0	0	0	5	0	0	0	23
China, Hong Kong SAR	9	4	0	0	0	0	0	0	0	5
Iran (Islamic Republic of)	14	9	0	0	0	0	0	1	0	4
Iraq	34	0	4	0	0	0	0	0	0	30
Kuwait	2	2	0	0	0	0	0	0	0	0
Saudi Arabia	2	2	0	0	0	0	0	0	0	0
Singapore	9	0	0	0	0	0	0	0	0	9
United Kingdom	228	0	0	0	0	0	0	0	0	228
Viet Nam	13	12	0	0	0	0	0	0	0	1
TOTAL	378	49	4	0	0	5	0	5	0	315

[1] Swine vesicular disease virus
[2] No foot-and-mouth disease, swine vesicular disease or vesicular stomatitis virus detected

Report for April to June 2002

Country	No. of samples	FMD virus serotypes							SVD virus[1]	NVD[2]
		O	A	C	SAT 1	SAT 2	SAT 3	ASIA 1		
China, Hong Kong SAR	5	2	0	0	0	0	0	0	0	3
Iraq	24	0	0	0	0	0	0	0	0	24
Lao (People's Democratic Republic of)	9	7	0	0	0	0	0	0	0	2
Malaysia	3	2	1	0	0	0	0	0	0	0
Republic of Korea	2	2	0	0	0	0	0	0	0	0
Thailand	10	1	9	0	0	0	0	0	0	0
United Kingdom	41	0	0	0	0	0	0	0	0	41
TOTAL	94	14	10	0	0	0	0	0	0	70

[1] Swine vesicular disease virus
[2] No foot-and-mouth disease, swine vesicular disease or vesicular stomatitis virus detected

FAO/OIE World Reference Laboratory for Rinderpest (RP) and peste des petits ruminants (PPR), Pirbright, UK
Report for January to June 2002

Country	Species	Disease	Diagnosis technique	Result
Iraq	Catte/sheep	RP/PPR	PCR	Negative
Iraq	Sheep/goats	PPR	PCR	Positive: PPR
Iraq	Sheep	PPR	PCR	Positive: PPR

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