GLOBAL RINDERPEST ERADICATION PROGRAMME (GREP) MEETING

The GREP Meeting on Rinderpest Surveillance, organized by the Joint FAO/IAEA Division, was held in Vienna, Austria, on 2 to 3 February 2000 (see page 3).

PESTE DES PETITS RUMINANTS IN TURKEY

In September 1999, an outbreak of peste des petits ruminants in goats in Elazig Province, eastern Anatolia, was reported by the Turkish Ministry of Agriculture and Rural Affairs to the International Office of Epizootics (OIE). This was the first outbreak of PPR in Turkey ever reported to OIE (see page 10).

COORDINATION MEETING ON SURVEILLANCE FOR THE ERADICATION OF SHEEP POX FROM THE MEDITERRANEAN MAGHREB

The meeting was held in Tunis on 17 to 18 February 2000 and reported good progress on the part of the four Maghreb countries in their efforts to control the disease in compliance with the recommendations of the last coordination meeting. The vaccination programmes have shown a marked increase in the target animal population even though, in most countries, the desired coverage rate is far from being achieved (see page 20).
Preliminary appraisal of current rinderpest epidemiology in Pakistan

The disease information available is sufficient to permit development of a working hypothesis for the determinants of rinderpest occurrence and to start to conceive a timely and cost-effective strategy leading to verified freedom from rinderpest. Indeed, verified freedom from rinderpest for Pakistan is achievable in the near future if appropriate additional resources can be applied to the task, guided by an epidemiologically based strategy. Many factors suggest that now is a most opportune time for the process to be initiated.

RINDERPEST

FAO Technical Cooperation Programme Project TCP/PAK/8923(A) – Strengthening disease surveillance for rinderpest and development of an eradication strategy

The National Workshop on Rinderpest Epidemiology, Surveillance and Control was conducted by Dr Peter Roeder (FAO Animal Health Officer – GREP Secretary) and Dr William Taylor (Consultant Rinderpest Epidemiologist) in Islamabad, Pakistan, from 21 to 24 February 2000, thus starting implementation of the TCP project.

The participants were directors-general and/or directors of livestock/animal husbandry for the provinces of Balochistan, North-West Frontier, Punjab and Sindh, and for the Northern Areas and Azad Kashmir, with the directors and senior veterinary staff of the NARC Animal Sciences Institute (Islamabad) and the Veterinary Research Institutes (Lahore, Quetta). The workshop provided an opportunity to access information available on rinderpest occurrence in Pakistan. Reports considered were both laboratory confirmed as well as suspected outbreaks where there was strong clinical, pathological and epidemiological evidence that the disease observed was rinderpest. Subsequently, Dr Taylor visited all of the provinces and areas with national staff. This enabled the understanding of recent rinderpest occurrence to be extended further.

It is acknowledged that there are serious deficits in the functioning of disease surveillance and reporting systems in Pakistan; nevertheless it was concluded that the federal and provincial veterinary services, NARC and PARC institutes do, in fact, have knowledge of the majority of outbreaks of rinderpest in recent years. It is probable that a proportion of the less severe outbreaks have been missed but identification of these would not greatly affect the conclusions reached.

The disease information available is sufficient to permit development of a working hypothesis for the determinants of rinderpest occurrence and to start to conceive a timely and cost-effective strategy leading to verified freedom from rinderpest. Indeed, verified freedom from rinderpest for Pakistan is achievable in the near future if appropriate additional resources can be applied to the task, guided by an epidemiologically based strategy. Many factors...
suggest that now is a most opportune time for the process to be initiated. There is a growing awareness in Pakistan of the importance of livestock to the national economy and of the fact that livestock development is an essential element of the drive towards poverty alleviation. All that is needed is the “vision” by all concerned that rinderpest eradication (rather than control) is necessary and achievable within a short time frame – possibly even achieved already – and that the Pakistan veterinary services have the capability to achieve it.

Given allocation of relatively modest resources, there do not seem to be any major constraints to achieving the goal of internationally recognized freedom from rinderpest. Establishing a National Programme for Rinderpest Eradication as a coordinating focus for all activities, with support from a European Union-funded Strengthening of Veterinary Services Project, could provide the drive needed and develop an institutional framework for application to other major epidemic disease problems such as foot-and-mouth disease and peste des petits ruminants.

These actions in Pakistan could effectively demonstrate the elimination of one of the last two remaining foci of rinderpest in Asia, providing safety assurances to other countries in the region (and beyond) which are currently assumed to be at risk of reintroduction – the most concerned and vulnerable being India, Nepal, Afghanistan, Tajikistan, Kyrgyzstan, Uzbekistan, Turkmenistan, Kazakhstan, Iran, Iraq, Yemen, the United Arab Emirates, Oman, Saudi Arabia, Turkey, Georgia, Armenia and Azerbaijan. Rapid progress to verified freedom could then follow in many countries in Asia.

The risk of reinfestation from Afghanistan needs to be clarified but evidence available suggests that the situation in that country resembles that existing in North-West Frontier Province, Pakistan – that is, no endemic persistence but at risk from livestock trade should there remain a reservoir of rinderpest in Pakistan. The threat to Pakistan of reinfestation of rinderpest from Yemen and the two known reservoirs in Africa is virtually nil.

Note: The full report can be obtained from the EMPRES Web site at: www.fao.org/waicent/faoinfo/agricult/aga/agah/empres/info/rinderp/pak99.htm

GREP Meeting on Rinderpest Surveillance

Many countries are in the process of surveying for antibodies after cessation of vaccination and have moved from seromonitoring (essentially detection of antibodies against the vaccine strain) into serosurveillance (detecting antibodies against possible field strains). Advice is required for all involved in GREP on which strategies should be employed in surveillance for rinderpest; this includes not only designing statistically based sampling frames but also determining which assays can be used and for what purpose.

GREP Meeting on Rinderpest Surveillance, Joint FAO/IAEA Division, Vienna, Austria, 2-3 February 2000

An increasingly lively debate has centred on the currently used competitive ELISA based on a monoclonal antibody (MAb) against the H protein of RBOK rinderpest virus. The main concern has stemmed from various field and experimental data linked with African Lineage 2 rinderpest virus. Some results have indicated that the test may not measure antibodies against this lineage of virus as efficiently as those produced against the vaccine strain. Hence, the use of the test in serosurveillance has been put in doubt.

An essential step in the eradication of rinderpest is to verify freedom by ceasing vaccination and then surveying for possible residual infection by active disease search supported by serological studies. In order to endorse tests for routine use, it is vital to understand their efficacy in detecting antibodies against all possible strains of rinderpest. Many countries are in the process of surveying for antibodies after cessation of vaccination and have moved from seromonitoring (essentially detection of antibodies against the vaccine strain) into serosurveillance (detecting antibodies against possible field strains). Advice is required for all involved in GREP on which strategies should be employed in surveillance for rinderpest; this includes not only designing statistically based sampling frames but also determining which assays can be used and for what purpose.

The GREP meeting sought to review the possible problems encountered with African Lineage 2 rinderpest virus infections and offer solutions and guidance for regulatory veterinary authorities and laboratories involved in assaying antibodies against rinderpest in the context of surveillance for the disease. It, therefore, drew on the data of key workers
engaged in studies of morbillivirus epidemiology, pathogenesis and immunology. The meeting also served to widen the discussion to consider current developments in assays that might be available for the detection of rinderpest and, thus, increase the possibilities for overcoming current and possible emerging problems associated with the final stages in the eradication of rinderpest. The conclusions indicate the considered opinions of the participants.

Presentations of recent, largely unpublished results of research concerning the diagnosis and surveillance of rinderpest were given by Dr Henry Wamwayi KARI, Muguga, Kenya; Dr John Anderson, IAH, Pirbright Laboratory, UK; and Dr Adama Diallo, CIRAD EMVT, Montpellier, France

Issues identified from the reports presented and their discussion

• The H₁ MAb C-ELISA has performed well for the purpose for which it was developed i.e. seromonitoring of herd immunity as a means of quality controlling rinderpest vaccination programmes.
• Data from experimental infections of cattle with Kenya-derived rinderpest of African Lineage 2 isolated from clinically affected lesser kudu and eland have given cause for concern as to the performance of the H₁ MAb C-ELISA in its efficiency (PI values above 50 percent) in detecting the early production of antibodies as evidence of infection. However, data presented indicated that the H₁ MAb C-ELISA did successfully measure antibodies within 30 days following infection with these strains.
• Data from Lineage 3 (Asia) virus infections indicated that the same reduced efficiency of detection of early antibodies using the H₁ MAb C-ELISA is also a feature with this virus lineage. Thus, it appears not to be a phenomenon related solely to African Lineage 2 virus. The performance with respect to African Lineage 1 has been insufficiently tested to draw similar conclusions.
• Experience has illustrated the difficulty of interpretation encountered when attempting to assess assay performance by testing field sera of unknown provenance. There is a lack of documented panels of sera for studies of assay performance. The meeting recommended that all future studies should ensure that sera from serial bleeds of experimentally infected animals are stored in sufficient amounts to facilitate future studies.
• The meeting stressed that serosurveillance, as used for the purpose of diagnostic/epidemiological investigations, must be viewed as one component of a disease surveillance system which includes clinical examination and the study of disease at the population level.
• The meeting concluded that the evolution of novel antigenic variants of rinderpest virus is possible and that this should always be considered in test developments, i.e. the need for broad antigenic specificity should be given due weight in the development of assays.
• The latest developments in other assays of relevance to the detection of antibodies against all lineages, discrimination of rinderpest and PPR antibodies and discrimination of vaccinated and infected animals were highlighted.

Agreement on challenges faced

Following these reports, it was agreed that the challenges facing the meeting were:
• To be able to advise countries on what antibody assay tool (or tools) can be used to determine whether or not rinderpest virus infection, caused by all known lineages of rinderpest virus, is present, or has recently been present, in a population of
bovine species (essentially cattle, water buffaloes and yaks).

- Ideally the assay (or assays in combination) should also be applicable to sera from all rinderpest infection-susceptible species, including African buffaloes, antelope species and sheep and goats.
- In addition to being able to discriminate clearly between rinderpest and PPR virus infection, an additional desirable attribute would be the ability for the assay (or combination of assays) to discriminate between antibodies derived from rinderpest vaccination (RBOK TCRV) and field infections with wild virus.

**Basic considerations in answering the challenge and conclusions**

In making decisions as to the suitability of assays it was concluded that it is essential to consider the purposes for which the assay (or combination of assays) is to be used. There are three separate issues:

1. **Seromonitoring as a tool for the quality control of vaccination programmes**
   For seromonitoring of vaccination programmes, the currently available H₁ MAb C-ELISA (designed for this purpose) is an effective tool.

2. **Serological surveys performed as a formal procedure to verify freedom from rinderpest, primarily in pursuit of the OIE Pathway**
   The H₁ MAb C-ELISA should continue to be the preferred assay.
   - Scientific data should be generated to demonstrate and give confidence that the H₁ MAb C-ELISA will eventually (say within 30 to 60 days) detect seroconversion (PI values of 50 percent or greater) in a high proportion of cattle infected with each of the three known extant lineages of rinderpest virus. As indicated in reports presented at the meeting, limited experimental data suggest that this is indeed the case. There is evidence that this is true for African Lineage 2 virus and the Asian Lineage virus (by 30 days) and RBOK vaccine (10 days). Additional testing is required to demonstrate this for African Lineage 1 virus and to extend the studies with African Lineage 2 virus.
   - Should it not prove possible to provide these assurances, an alternative assay or combination of assays would be needed.
   - A statistician should review the recommendations for serosurveillance for rinderpest to assess whether or not the sampling frame recommended is affected by these considerations.

3. **Serological assays as a component of active disease surveillance seeking to disclose populations of bovine animals (and ideally other susceptible species including, in order of priority, wild buffaloes and antelopes, and sheep and goats) in which rinderpest of any lineage could recently have been, or still could be, present (i.e. an investigation tool)**
   - There is no escaping the fact that no single assay currently available (and validated) is capable of achieving the required sensitivity and specificity for the detection of recent rinderpest virus infections caused by all lineages of rinderpest virus.
   - Research and field trials are urgently needed to define the performance of new assays or combinations of assays.

**Note:** The full report can be obtained from the EMPRES Web site at:
OIE/FAO mission to the Russian Federation

There is insufficient information on which to base a definitive statement as to the origin of the rinderpest virus that caused the outbreak. Molecular characterization data suggest a close relationship between the outbreak virus and the K37/70 rinderpest vaccine virus, but a causal link between the two viruses has not been established. Further investigations are needed to clarify the issue.

Findings of the OIE/FAO mission (21 June to 2 July 1999) to the Russian Federation concerning the outbreak of rinderpest in Amur region in 1998 The occurrence of rinderpest in the far eastern part of the Russian Federation, reported in August 1998 by the Veterinary Department of the Russian Federation to the International Office of Epizootics (OIE), was a cause of grave concern for the Global Rinderpest Eradication Programme (GREP). The Russian Federation had hitherto been considered to be free from rinderpest and there was no known connection to the nearest foci of rinderpest persistence thought to be in Pakistan. OIE proposed that FAO should participate in a mission, with an FAO rinderpest expert, to explore with the Russian authorities the circumstances leading to the outbreak.

The mission concluded that the Amur region outbreak, which affected a single isolated village, was unlikely to have arisen by the spread of rinderpest from a persisting focus of infection, either in domestic animals or in wildlife, within the Russian Federation.

Similarly, transboundary spread from a neighbouring country is unlikely to provide an explanation. There is insufficient information on which to base a definitive statement as to the origin of the rinderpest virus that caused the outbreak. Molecular characterization data suggest a close relationship between the outbreak virus and the K37/70 rinderpest vaccine virus, but a causal link between the two viruses has not been established. Further investigations are needed to clarify the issue. Reversion to virulence of the vaccine strain is a factor which must be considered. The Russian authorities reject this possibility because the vaccine has been extensively tested experimentally and used widely over many years in the field without reactions being observed. Obviously, such a reversion to virulence, should this be the case, must be a very rare event. Available evidence, albeit much of it circumstantial, suggests a common cause for the outbreak in Amur region and earlier ones in Georgia in 1989 and Chita/Tuva in 1991 to 1993. Certain epidemiological issues need to be clarified. Further molecular characterization studies could be informative.

The Veterinary Department is well represented and active down to village level in the region. The outbreak was eliminated effectively and there have been no subsequent events to suggest the continuing presence of rinderpest. Accordingly, it is believed that the far eastern part, and almost certainly the whole of the Russian Federation, is currently free from rinderpest. The Russian Federation does not appear to be at any immediate risk from rinderpest outbreaks arising either from internal persistence of infection or
introduction of rinderpest from neighbouring countries as there is growing confidence that they are all currently free from rinderpest. If rinderpest were to be introduced into these countries, it is expected that there would be adequate warning for the Russian authorities to take appropriate preventive action.

For progress to be made in the verification of freedom from rinderpest, the region comprising the Russian Federation, China and Mongolia needs to develop mutual confidence through verification of lack of rinderpest viral activity. The GREP secretariat, working with partner agencies in the Global Rinderpest Eradication Programme, and the Russian authorities should collaborate in clarifying the epidemiological issues. Similarly, FAO and partners should seek to provide a forum for sharing epidemiological information between China, Mongolia and the Russian Federation. This will involve collating and analysing as much information as possible from the Russian Federation and its neighbouring countries, including the Transcaucasian region, concerning the occurrence of rinderpest, especially with respect to the 1989, 1991-93 and 1998 rinderpest incidents. Efforts should be made in particular to trace any surviving rinderpest viruses and submit them for phylogenetic analysis in collaboration with the FAO World Reference Laboratory for Rinderpest (Institute for Animal Health, Pirbright Laboratory, United Kingdom).

Note: The full report can be obtained from the EMPRES Web site at: www.fao.org/waicent/faoinfo/agricult/aga/agah/empres/info/rinderp/Rusrep.htm

Sudanese workshop on rinderpest disease surveillance and epidemiology

There is currently no evidence for the persistence of rinderpest in the Sudan outside an area in eastern Equatoria around Torit and Lafon, bordered on the east by the Lopit hills. Even though there are severe constraints on accessibility, there is growing confidence that the Toposa herds are now free from rinderpest and that probably the areas to the north and the area of eastern Equatoria west of the White Nile are also free.

Technical Cooperation Programme project TCP/SUD/8923 – Emergency Strengthening of Rinderpest Surveillance and Control in Western Sudan

Background

The concerted global effort under the Global Rinderpest Eradication Programme (GREP) has reduced rinderpest persistence to only four sites in the world. Outside Africa, these are situated in Pakistan, with occasional spread into Afghanistan, and in Yemen. At the end of the Pan-African Rinderpest Campaign (PARC) in 1999, only two areas of rinderpest persistence appear to remain in Africa. One involves the Somali cattle herds of southern Somalia and northeastern Kenya. The other involves the extensive pastoral herding systems of the southern Sudan with contiguous areas of the neighbouring countries Ethiopia, Kenya and Uganda. While the conditions prevailing in the southern Sudan make it difficult to obtain hard data, there is now evidence of a rinderpest outbreak occurrence close to Torit in eastern Equatoria in mid-1998. There is no evidence for the persistence of rinderpest in the Sudan outside an area in eastern Equatoria around Torit and Lafon, bordered on the east by the Lopit hills. Even though there are severe constraints on accessibility, there is growing confidence that the Toposa herds are now free from rinderpest and that probably the areas to the north and the area of eastern Equatoria west of the White Nile are also free.

Thus, the world is close to the final complete eradication of rinderpest and the Sudan is a most important country for GREP. It is one of the foci of the Five-Year Intensified GREP Action Programme which started in 1999 aiming at eradicating the last remaining foci by the end of 2002. Livestock production is of great importance for the well-being of the Sudanese people and export earnings contribute very significantly to the national income. The Sudan demonstrated its commitment to rinderpest eradication in 1999 by
making a formal declaration to OIE of provisional freedom from rinderpest for the northern Sudan, backdating it to 1996 when the issue was first raised with OIE. The positive results of this proof of status have already been felt in an improved cattle trading position. The Sudanese authorities wish to proceed quickly to a status of rinderpest freedom for the whole country. Consequently, the Sudanese Government requested assistance from FAO under its Technical Cooperation Programme (TCP) to strengthen surveillance and control of rinderpest. This US$290 000 project provides for the physical inputs of equipment and supplies and, perhaps most important, training to strengthen disease surveillance and control leading to eradication.

Workshop on Emergency Strengthening of Rinderpest Surveillance and Control in Western Sudan

In this context, the Workshop on Emergency Strengthening of Rinderpest Surveillance and Control in Western Sudan was organized under the auspices of the TCP project by PARC Sudan in collaboration with FAO. Held at PARC headquarters, Soba, Khartoum from 17 to 22 January 2000, technical training was conducted by FAO Animal Health Service staff member Dr Peter Roeder (GREP Secretary) and two highly experienced consultants, Dr Berhanu Bedane and Dr Gijs van’t Klooster (currently Technical Adviser to PARC Ethiopia). Some 30 participants were selected essentially from Zone B outlined in the PARC strategy for rinderpest eradication as well as from headquarters staff. In conducting the workshop the trainers drew on their experience in the very successful Ethiopian rinderpest eradication campaign, which achieved success in 1995, and the experience of some innovative and successful campaigns in other areas of the world.

The workshop concentrated on providing the most recent knowledge of rinderpest epidemiology, with guidance on rinderpest recognition, together with the principles of an epidemiology-based dynamic approach to rinderpest elimination and emergency preparedness through contingency planning. This is based essentially on the need to abandon relatively ineffective mass vaccination campaigns in favour of intensive surveillance for a “stomatitis-enteritis syndrome” which includes rinderpest and emergency preparedness to safeguard against incursions of rinderpest. In essence, the strategy relies on strengthening surveillance and emergency preparedness while focusing eradication by intensive vaccination on areas of virus persistence. The final eradication procedure, in fact, starts only when mass vaccination ceases. This is in recognition of the fact that suboptimal vaccination programmes which achieve immunity rates below a minimum 70 percent cannot be relied on to result in eradication of rinderpest from extensive pastoral areas. In free areas, such vaccination does not prevent the spread of rinderpest but serves to slow down the spread and make the disease more difficult to detect.

The principles and requirements of passive disease surveillance, disease reporting and active disease search were discussed in detail. The principles were then related to the specific situation of the Sudan in order to draw up a plan of action aimed at rapidly demonstrating progress in rinderpest eradication. The workshop was considered to have been highly successful as a result of the active contribution by the participants.

Note: The full report can be obtained from the EMPRES Web site at: www.fao.org/waicent/faoinfo/agricult/aga/agah/empres/info/rinderp/Sud00.htm
GREP promotional materials

EMPRES has produced a number of promotional materials to raise awareness of the Global Rinderpest Eradication Programme. To date we have available:

- a video film “The World Without Rinderpest” (13 minutes). This is currently available in English but will also be produced in French and Arabic in the near future;
- four posters on the theme “Working to stamp out cattle plague by 2010” in French and English (see page 1);
- a GREP “flyer” or leaflet with the theme “Why action now is more important than ever”. This is in English but will also be produced in French.

A series of disease information sheets is also in preparation and should be available later this year, starting with one on rinderpest. These are intended to provide a vignette of each disease which can be used to explain the basic facts of disease impact and control to non-veterinarians.

These materials will be distributed to Ministries of Agriculture in the countries which comprise the active focus of GREP and to international organizations.

Note: We are grateful to the Government of Ireland for providing the financial support for the production of these materials.

Peste des petits ruminants in Iraq

An FAO Technical Cooperation Programme (TCP) project was implemented to help eliminate PPR through focused vaccination, to establish and strengthen laboratory-assisted surveillance, to enhance the diagnostic capacity of field veterinary staff and to form a national network for surveillance and early warning systems against transboundary animal diseases.

In September 1998, Iraq reported an outbreak of peste des petits ruminants (PPR) in its northern governorates to OIE and FAO. Although this disease had been suspected in the central and northern governorates for several years, and was known to be present in neighbouring countries, this was the first official report of PPR in the country and caused great concern. PPR is a serious disease economically, and its transboundary nature could compromise control programmes for both PPR and rinderpest in neighbouring countries. Owing to the international sanctions imposed on Iraq, the Iraqi veterinary authorities had few resources to cope with this highly contagious disease of small ruminants.

The Iraqi Ministry of Agriculture requested FAO’s assistance in controlling PPR. In 1999, an FAO TCP project was implemented to help eliminate the disease through focused vaccination, to establish and strengthen laboratory-assisted surveillance, to enhance the diagnostic capacity of field veterinary staff and to form a national network for surveillance and early warning systems against transboundary animal diseases. Vaccines, laboratory equipment and other materials were supplied, and two consultants, Dr Samir Hafez and Dr Adama Diallo, travelled to Iraq to assist in these tasks in late 1999. The consultants conducted workshops on laboratory methods in Baghdad, and on PPR recognition and control in 12 governorates.

The extent of PPR in Iraq was not well defined prior to the project, and still needs more investigation. However, information exchange during the consultancies has led to awareness building and an increased understanding of the situation:

- During the last few years, PPR was seen clinically in sheep and goats in Irbil and Dahuk Governorates, and has been suspected clinically in Mosul, As-Sulaymaniyah and Ta’amim, all of which are in the north of the country, whereas no clinical disease was suspected in the central and southern governorates. Being a disease that is easily confused with rinderpest in small ruminants or various infections leading to pneumonic signs, as well as being an exotic disease until recently, insufficient
capacity to recognize PPR may have caused underreporting of the disease.

- The project has provided laboratory equipment and training for virus isolation, and the importance of collecting samples for virus isolation (tears, tissues) was stressed during the consultants’ workshops. The diagnosis of PPR was finally confirmed (World Reference Laboratory) by polymerase chain reaction on nasal and ocular swabs collected in May 2000.
- Serological samples taken in the country prior to the suspected outbreak in 1998 were few and inconclusive.
- Results from serological samples taken after the suspected outbreak, and before any vaccination had started, established with high certainty the presence of natural PPR infection in northern Iraq. The status for the rest of the country remains uncertain.
- Before the TCP project had started and homologous PPR vaccine could be delivered, rinderpest vaccine was used to immunize small ruminants in northern Iraq. Unfortunately, vaccination took place without any ear-tagging or other identification of the animals, complicating any further serological studies of both PPR and rinderpest. Upon delivery of 1 500 000 doses of homologous PPR vaccine, a vaccination campaign in the northern governorates has been concentrated at the border areas with Mosul and with Turkey.

The TCP project provided the Central Veterinary Laboratory in Baghdad with laboratory equipment and reagents (C-ELISA and immunocapture ELISA for PPR and rinderpest), and training for their use. In Erbil (northern governorates), ELISA equipment was already available. A need for further training and support was identified in both places to reach a fully functional capacity of these laboratories.

The outbreak of PPR in 1998 was temporarily controlled in the affected areas, and the level of awareness and capability to discover and control new outbreaks has been increased during the TCP project. It was recommended not to carry out a countrywide mass vaccination until a better knowledge of the PPR infection has been obtained. A serosurveillance campaign for PPR was initiated in December by the Director-General of the Iraqi State Board for Veterinary Services. It is hoped that this campaign will shed light on the distribution of PPR in the remaining parts of the country.

Peste des petits ruminants in Turkey

Turkish Ministry of Agriculture reports PPR

In September 1999, an outbreak of PPR in goats in Elazig Province in eastern Anatolia was reported to OIE. This was the first outbreak of PPR in Turkey ever reported to OIE.

A total of 47 goats were affected with six reported dead. No sheep were reported to be affected. The diagnosis was based on clinical, post-mortem and laboratory diagnoses. The disease was suspected to be related to movements of animals from the east. An emergency ring vaccination using homologous PPR vaccine was initiated. Subsequently, in January 2000, two new reports of PPR were sent by the Turkish Ministry of Agriculture and Rural Affairs to OIE. These two locations are situated in different parts of the country: Isparta in the west and Mardin in eastern Anatolia. Affecting sheep only on this occasion, 416 cases and 38 deaths were reported.

No information has been received regarding control actions and follow-up of these incidents.
NEWCASTLE DISEASE

Virulent Newcastle disease virus in Australia

Recurring outbreaks of virulent Australia-origin Newcastle disease virus in Australia require new strategy

Following the last reported outbreaks of virulent Newcastle disease in New South Wales (reported in EMPRES Bulletin No. 10), the situation again deteriorated in December 1999. At least five new incidents were identified in the following three months and the virus was found as far as 300 km north of Sydney, in addition to its presence in the outskirts of Sydney. As was reported in EMPRES Bulletin No. 10, the outbreaks are caused by virulent mutants of an endemic Australian low-virulence virus; there is, however, no known connection between the farms. Recent research suggests that these virulent viruses have been present in the Australian poultry flock for longer than was originally thought, and a survey is being undertaken to determine the true prevalence and the distribution of the virus.

The Consultative Committee on Emergency Animal Diseases (CCEAD) has determined that this particular virus is non-eradicable in New South Wales in the short to medium term. Stamping out is no longer carried out but the flocks are still quarantined, and consultations between the government and the poultry industries are continuing to develop a long-term management strategy for dealing with the disease. The national plan, to be managed by the industry, will incorporate vaccination within a risk management context, in the absence of disease. There is still a commitment by the Agricultural and Resource Management Council of Australia and New Zealand (ARMCANZ) to a full stamping out programme in the event of an incursion of virulent Newcastle disease virus of exotic origin.

Sources of information:
OIE disease information: www.oie.int/info/A_info.htm;
New South Wales Agriculture: www.agric.nsw.gov.au/;
ProMED-ahead: www.promedmail.org:8080/promed/promed.folder.home

RIFT VALLEY FEVER

Rift Valley fever in Mauritania

Rift Valley fever (RVF) is an insect-borne disease affecting humans and animals. This is a major zoonosis in several African countries, particularly in Mauritania.

The presence of RVF virus in Mauritania was first suspected in 1984 as a result of serological investigations carried out by the national breeding and veterinary research centre (CNERV). Investigations concluded that the circulation of the virus was enzootic in the country and that the disease was likely to break out any time. This finally happened during the 1987 rainy season in the Trarza region (southwestern Mauritania). More than 200 human deaths were registered. Massive abortions (up to 100 percent within herds), stillbirth and high mortality rate in young animals were observed among domestic animals. Several viral strains were isolated from human samples, while only serological evidence of the disease (high IgM and IgG prevalence rate – up to 80 percent) was found in animals. Symptomatology in humans was fever, myo-arthralgy, with neurological and haemorrhagic signs, which explains why it was so difficult to decide on a differential diagnosis with other haemorrhagic fevers (particularly yellow fever and true neurological form of malaria). During the next rainy season, another human outbreak of RVF was
diagnosed in the city of Aïoun el Atrouss (Hodh el Gharbi region) with viral isolation. Serological investigations carried out by CNERV from 1989 to 1992 showed a decreasing prevalence rate among animals, followed by an increase in several places from 1994 to 1997. This evolution is the sign of an occult viral circulation, with small confined outbreaks. Aware of this situation and of the danger of RVF in humans, the veterinary service decided to include this disease in the Mauritanian epidemiological survey network (REMEMA), created in 1998.

Ten years after the major 1987 epidemic, RVF reappeared in the Hodh el Gharbi region during the 1998 rainy season. The disease was responsible for more than ten human deaths and, according to the livestock owners, for a high abortion rate and some stillbirth among animals. Several human and animal viral strains were isolated. It was the first time that RVF virus was isolated from animals in Mauritania. Because of this new outbreak, Mauritania, Senegal and Mali requested FAO’s assistance. After a joint FAO/OIE/WHO evaluation mission, FAO granted a national TCP project to Mauritania, and a regional TCP project to Mauritania, Senegal and Mali.

In the meantime, with French Cooperation assistance and the participation of the Institut de Recherche pour le Développement (IRD) and the Pasteur Institute in Dakar, the Mauritanian veterinary services carried out several field missions to assess the sanitary human and animal situation, and to investigate the potential vectors. The information collected during these missions contributed to a better understanding of the human and veterinary epidemiological feature of the disease. Furthermore, in the framework of the National Disease Surveillance System (REMEMA), nine sentinel herds (sheep and goats) were established in five regions of the country in order to monitor RVF.

IgG-positive animals were found in all herds, and a small number of IgM-positive animals were found in six different sentinel herds scattered in five regions, thus proving the persistence of RVF virus circulation on a large scale in the country.

Three outbreaks were diagnosed during the 1999 rainy season through REMEMA’s activities and the TCP investigation missions in the Tagant, Guidimakha and Trarza regions. Three suspected human deaths (IgM-positive and influenza-like syndrome, sometimes associated with bleeding), massive abortion in small ruminants (more than 30 percent) and stillbirth were registered in the Tagant outbreak. In Guidimakha and Trarza, RVF was suspected in small ruminants because of massive abortion and stillbirth rates, and was confirmed by IgM- and IgG-positive serology.

Finally, RVF seems to have established itself in the main livestock husbandry areas of Mauritania. Its increase during the past two years has led Mauritanian sanitary authorities to take appropriate decisions (investigations, survey, communication on the disease, international and regional cooperation). As a result, the Veterinary Services have a better understanding of RVF epidemiology in Mauritania. Furthermore, a sensitization campaign concerning the disease was organized to inform the population (veterinary and health services, breeders and
breeding associations, sponsors, etc.) about the risks of transmission and the possibility of preventing the disease from spreading.

All past studies show how necessary it is to keep on surveying for RVF and to carry on research activities. Future research-related activities will focus on the symptomatology of the disease (beyond abortion and stillbirth), the identification of the vectors and reservoirs responsible for the low circulation and maintenance of the virus between epizootic periods.

*(Contributed by: Dr Yaghouba Kane, Infectious Disease Service, CNERV, BP 167, Nouakchott, Mauritania; e-mail: cnerv@opt.mr)*

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### AN EPIDEMIOLOGICAL SURVEILLANCE NETWORK FOR MAURITANIA

An epidemiological surveillance network for animal diseases, REMEMA, was created in Mauritania at the end of 1998. Its official recognition through a ministerial decision should demonstrate its sustainability.

The elaboration of an epidemiological surveillance network was becoming necessary after the cessation of rinderpest vaccination in 1998. It was also an excellent opportunity to restructure the disease information collecting system related to major livestock epidemic diseases in Mauritania.

REMEMA links the different stakeholders of the animal health surveillance system: the national veterinary administration, the national veterinary laboratory (CNERV), private veterinarians and livestock owners. Although the Mauritanian Government is fully responsible for the network, since its creation it has been financially and technically supported by the European Union, through the PARC project, and French Cooperation and its technical assistance (one post of a veterinarian, specialist in epidemiology).

REMEMA’s activities take place in the major animal husbandry areas of the country, that is the eight southern provinces. It was decided that REMEMA should focus on four main diseases: rinderpest (RP), contagious bovine pleuropneumonia (CBPP), Rift Valley fever (RVF) and foot-and-mouth disease (FMD). The encouraging development of the network allowed the inclusion of two other diseases – rabies and peste des petits ruminants (PPR).

The surveillance network relies mostly on passive surveillance: field agents send standardized reporting forms and samples to the Central Unit when they suspect an outbreak. Active surveillance through field investigations is not possible at present owing to limited resources. However, on occasion, REMEMA carries out specific investigations: for example, during the 1999 rainy season nine sentinel herds were regularly visited by REMEMA’s field agents in the framework of RVF surveillance. A quarterly bulletin, REMEMA info, is the network’s main communication tool. Two issues have already been published, and a third is now being processed.

Thanks to the strong motivation of the field agents, we can be reasonably optimistic about REMEMA’s future.
**REMENA in figures**
Number of field agents: 54
Number of survey posts: 38

*Results from October 1998 to December 1999*
Number of monthly reports: 111
Number of RP cases suspected: 1 (confirmed: 0)
Number of CBPP cases suspected: 3 (confirmed: 0)
Number of RVF cases suspected: 7 (confirmed: 3)
Number of FMD cases suspected: 3 (confirmed: 1)

*(Contributed by: Dr Fabien Schneegans, Epidemiology Service, CNERV, BP 167, Nouakchott, Mauritania; e-mail: (CNERV) cnerv@opt.mr or (DEA)drap_sa@toptechnology.mr)*

**TCP/RAF/8931: Implementation of a Rift Valley fever surveillance system in Mali, Mauritania and Senegal**

In addition to the project which was implemented in Mauritania, a regional project covering Mali, Mauritania and Senegal was initiated in April. One of its main activities is to establish a common surveillance approach for RVF among the three countries, by monitoring a sentinel herds network and strengthening disease surveillance activities. It will also be an excellent opportunity to assess the real impact of Rift Valley fever in Mali, which is not known at present, although it is obvious that the virus circulates in the livestock population.

At the end of the project, the various partners involved in RVF surveillance- and research-related activities will meet together at a workshop which will be held in Dakar in November 2000 to define a common control strategy.
FOOT-AND-MOUTH DISEASE

Workshop on the non-structural protein ELISA test

The European Commission for the Control of Foot-and-Mouth Disease (EUFMD Commission) organized a workshop on the detection, using the ELISA technique, of antibodies against FMDV non-structural protein 3ABC at the Istituto Zooprofilattico Sperimentale della Lombardia e dell’Emilia (IZSLE), Brescia, Italy from 18 to 21 January 2000. The workshop was sponsored by the European Communities (EC) through the EC/EUFMD Trust Fund 911100 on the recommendations made by the Tripartite FAO/EC/EUFMD meeting for the Balkans, held on 13 October 1999, and the 63rd session of the Executive Committee held in Sithonia, Greece, on 4 and 5 November 1999. Seven laboratory specialists participated — from Bulgaria, Greece, Turkey and Belgium (invited by the IZSLE in the framework of an EU Concerted Action). The instructors were experts from the World Reference Laboratory (IAH, Pirbright, UK) and from the IZSLE.

During infection by the FMD virus, antibodies to both structural and non-structural proteins are produced in the animal, whereas after vaccination generally only antibodies to structural proteins are induced. Research has shown that the detection of antibodies to the non-structural protein 3ABC can be a useful tool in the diagnosis of FMD virus and the differentiation between infected and vaccinated animals. A monoclonal-trapping ELISA (MATELISA) using MS-3ABC was developed by the IZSLE and has been used successfully in the investigation of sera from Albania, The Former Yugoslav Republic of Macedonia and Caucasia. It has also been used in Argentina for demonstrating the absence of circulating virus. At Pirbright, United Kingdom, a MATELISA based on the Brescia test but using GST-3ABC as antigen has been developed and used in testing sera from suspected outbreaks in the Balkans and North Africa. It is expected that the 3ABC ELISA could become a major tool for serosurveilance of FMD. Under the new EC legislation for FMD control which is in preparation, it is foreseen that if ring vaccination is carried out for controlling an outbreak, the 3ABC test will be required for all vaccinated animals. The workshop in Brescia will initiate the first phase in the transfer of 3ABC ELISA technology to the national FMD laboratories in the Balkan countries.

(Contributed by: Dr Yves Leforban, EUFMD secretariat.)

DROUGHT IN EASTERN AFRICA

Drought in eastern Africa causes concern

In the past, droughts in eastern Africa seem to have been a precipitating factor in causing rinderpest to flare up in stressed cattle and wildlife populations. This is presumably because drought causes extensive migration of pastoral herds in search of the scarce water and grazing available and the resulting livestock congregations provide ideal conditions for virus transmission. Thus, the scene could be set for a recapitulation of the events which started in 1992/93 leading to the infestation by rinderpest of Tsavo National Park in 1994, spreading eventually to Nairobi National Park, Kajiado and northern Tanzania in 1996.

Reports are increasing of renewed drought in eastern Africa particularly affecting areas of southern Ethiopia, southern Somalia and eastern Kenya. Once again the livelihoods of the pastoral communities will be affected and their livestock, on which they are heavily dependent, could be at risk not only from drought but also from a resurgence of epidemic diseases. Particular concern at this time relates to rinderpest, given that the rinderpest status of the southern Somali ecosystem is largely undefined. In the past, droughts in eastern Africa seem to have been a precipitating factor in causing rinderpest to flare up in stressed cattle and wildlife populations. This is presumably because drought causes extensive migration of pastoral herds in search of the scarce water and grazing available and the resulting livestock congregations provide ideal conditions for virus transmission. Thus, the scene could be set for a recapitulation of the events which started in 1992/93 leading to the infestation by rinderpest of Tsavo National Park in 1994, spreading eventually to Nairobi National Park, Kajiado and northern Tanzania in 1996.
After this episode, coordinated interventions by the Governments of Kenya and the United Republic of Tanzania succeeded in reversing the spread of rinderpest to the point where declarations of provisional freedom from rinderpest were possible for the whole of Tanzania and a large zone of Kenya.

If a recapitulation of the earlier events is occurring now, or does so in the near future, it will be a severe test of Kenya’s defences which include maintenance of a vaccinated buffer zone in the east of the country. The need for vigilance in this highly vulnerable area is of paramount importance and merits support. Fortunately, the Kenyan Department of Veterinary Services, OUA-IBAR and the EC joined forces under the PARC programme to organize cattle vaccination programmes using the private sector and non-governmental organizations (NGOs) against rinderpest at Garissa and in Coast Province.

The maps illustrate progressive drying of the pastures in eastern Africa, particularly in Ethiopia, Kenya and Somalia. NDVI values obtained by remote sensing, expressed as the difference between monthly values and the monthly mean of the last 15 years, are shown as coloured pixels on the map. Areas shown as red/brown or dark grey are drier than normal.
To date, TADinfo has been deployed in some 16 countries in Africa and Asia, and requests from other countries in Africa, the Near East and South America are being processed.

The lessons learned so far have shown that in countries where there is a “culture” of data collection and at least some limited computer processing the implementation of the software is smooth and results are achieved very quickly.

The main problems experienced in implementation have been:

- **In-country surveillance systems supply insufficient data.** In countries where surveillance systems are poorly developed, data are insufficient to justify investing in computerized data input and analysis. Entering one or two records per month simply does not justify the hardware and software designed to handle thousands of records per month. It is essential that on-the-ground surveillance should be up and running in order to feed TADinfo with the right kind of data.

- **Data available but in the wrong form.** Many countries collect large amounts of data, but they are often in a summarized form, e.g. “number of outbreaks of disease X in district Y for month Z”. TADinfo is a GIS-based system for which summary data are simply not good enough. It should be emphasized that TADinfo requires data on a “date-locality” basis – each observation of disease with its date, the locality where it was seen, species affected, etc., must be reported. Without this type of data, maps cannot be generated, and it becomes impossible to use TADinfo to support reporting to OIE. TADinfo has been developed to record diseases on the basis of specific observations made, and it cannot accept summarized data. In fact, TADinfo generates its own summaries!

- **Epidemiology Unit staff not sufficiently experienced in using the Windows-type of operating system with a graphical user interface.** This is a major handicap, as it means that users are often not able to configure the system properly, and are not able to export data to other software for further analysis.

Apart from these problems encountered in a few countries, we are happy to note the many positive experiences of our growing TADinfo user group. One of our newest users is Dr George Nipah, of the Epidemiology Unit of the Directorate of Veterinary Services in Ghana.
INTRODUCING TADINFO IN GHANA

The search for an appropriate decision support system for the Veterinary Services Department might have started way back in the 1930s when the colonial veterinary service was organized in what was then Gold Coast. I saw evidence of this when I first began to computerize the compiled national veterinary activities in 1991. There were notebooks containing even a 1930 summary of major veterinary activities carried out by the various regional veterinary sections. The summaries of yearly scheduled diseases, vaccination, deworming and spraying, movement and slaughter, export and import records in the notebooks served as the decision support system for the directorate.

Under the National Livestock Services Project, a database system was organized with assistance from a consultancy company for the major veterinary activities in Ghana. The main limitation of the programme was that it had no geographical information component. The introduction of the TADinfo programme has resolved this. Our data can be visualized on a simple geographical information system. Risk assessment and disease management can easily be visualized by the decision-maker and, more important, by the politician.

TADinfo, apart from being free, is to some extent easy to use. A two-week tutorial workshop (2-6 August 1999 and 31 January - 4 February 2000) with Dr Roger Paskin of FAO, Rome has been enough to allow me to prepare maps on ASF outbreak areas in Ghana. I have also started preparing maps on last year’s scheduled diseases outbreaks for the annual report of the Veterinary Services.

This year, Ghana will be part of the Pan African Control of Epizootics (PACE) project where epidemi-surveillance of some transboundary diseases such as rinderpest and contagious bovine pleuropneumonia is a vital component. The TADinfo Disease Observation Module will help me analyse active surveillance data while the Disease Survey Module is my panacea to PACE serological surveillance.

Linking the laboratory data with the field data was a problem in our previous database. It was difficult to distinguish laboratory-confirmed cases from clinical and suspected cases. The option “best available diagnosis available” in TADinfo has solved this! The brief exposure to TADinfo has convinced me that the programme when fully completed would be the practising epidemiologist’s main tool.

George Nipah
Epidemiology Unit, Veterinary Services Department, Accra, Ghana
### CONTRIBUTIONS FROM FAO REFERENCE LABORATORIES AND COLLABORATING CENTRES

#### FAO/OIE World Reference Laboratory for FMD, Pirbright, UK

**FMD report for January to March 2000**

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#### FAO World Reference Laboratory for Rinderpest, Pirbright, UK

**Rinderpest and PPR report for January to March 2000**

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Outcome of the Second Annual Coordination Meeting on Surveillance for the Eradication of Sheep Pox from the Mediterranean Maghreb

The meeting was held in Tunis, at the FAO Subregional Office, on 17 and 18 February 2000. In addition to the RADISCON Coordinator, Operator and Support Officers, Dr Y. Leforban, Secretary of the European Commission for the Control of Foot-and-Mouth-Disease, RADISCON Support Officer Dr Karim Ben Jebara and FAO consultant Dr P.C. Lefévre, the meeting was attended by the Chief Veterinary Officers (CVOs) of Morocco and Tunisia, the RADISCON National Liaison Officers (NLOs) of Algeria, Tunisia and the Libyan Arab Jamahiriya, the Alternate NLO of Morocco and the three national experts from Algeria, Morocco and Tunisia who had been involved from the start in the preparation of the background documentation for this programme.

The first part of the meeting addressed the following issues:
• the regional approach to disease control;
• the epidemiological situation and control measures for sheep pox and FMD in the three countries recently affected with the disease (Algeria, Morocco and Tunisia);
• the concepts of risk analysis and emergency preparedness; and
• a review of the progress made in the implementation of the Sheep Pox Programme.

The four countries have made considerable advances in their efforts to control the disease in compliance with the recommendations of the last coordination meeting. The annual vaccination programmes, for example, have shown a marked increase in the target animal population even though – with the exception of Morocco – the desired 80 to 85 percent vaccination coverage rate is still far from being achieved. There is a steady reduction in the incidence of the disease, as was highlighted through systematic laboratory differentiation of sheep pox from contagious ecthyma in Algeria and Morocco.

It is now more important than ever to consolidate these efforts if the aim is to suppress definitively the high recurrent annual cost of the disease and vaccination campaigns, which
are being progressively replaced by close surveillance of the disease and a stamping out policy. The possible shortcomings that may arise as the programme evolves were discussed and it was felt that they would be easily overcome if the higher decision-makers were made more aware of the relevance of this ambitious endeavour.

To make the programme known in the farming community, 30 000 posters have been produced and are being widely disseminated in the four countries as well as leaflets which will be distributed to village schools to sensitize children’s parents to the programme.

Booklets are also in preparation to indicate the main clinical signs for recognition of the disease and the field action to be taken following the suspicion of a sheep pox outbreak. This is especially important now that the number of within flock clinical cases is diminishing owing to the residual immune status in the sheep populations.

It was decided that the mid-year meeting should take place upon completion of the current vaccination campaign in the four countries to monitor the vaccination results and evaluate the harmonization efforts among countries during the campaign. An expert in vaccinology will be proposed jointly by Algeria and Morocco to assess the production process of the sheep pox vaccine in these two countries where it is being produced. Each country will also update its legislation, rectifying any possible inconsistencies, and adapt it progressively to the control/eradication programme as it evolves.

The second part of the meeting was devoted to reviewing the FMD situation in the four countries and to the preparation of a regional programme for the control of the disease. There has been no report of FMD in any of the Maghreb countries since April 1999. Therefore the question was whether the vaccination which is currently being used for the control of the disease should be pursued and for how long. Another important issue is the role of small ruminants in the epidemiology of FMD and the relevance of immunizing them. With the exception of Tunisia, which has been vaccinating small and large ruminants with bivalent vaccine since 1989, the other countries vaccinate cattle only. This is due to the large population of small ruminants and the incurred costs of such a strategy. The question of which virus strains are to be included in the vaccine was also raised. It was agreed that O type, which is dominant in the Near East, would be the more appropriate type to be included. The other types (A, SAT 2, Asia 1) should also be considered if there is a threat of their introduction in the region.

Surveillance of FMD in the neighbouring countries, and especially in sub-Saharan African countries, should be reinforced so that immediate action can be taken in the Maghreb in case of a specific threat with the new strains.

The four countries recommended that a regional programme for FMD control and surveillance should be established under FAO’s coordination, based on the model of the sheep pox eradication programme. Under this programme, all cattle should be vaccinated against O type for a minimum period of three years, preferably using vaccines with a minimum potency of 6 PD50. Meanwhile, surveillance of the disease will be reinforced particularly on the southern and eastern borders of the region. The capacity for diagnosis will be upgraded in the four countries with the establishment or adaptation of one national FMD laboratory in each country. The situation should be re-examined after three years to
verify whether vaccination could be progressively abandoned in the countries west of the Maghreb. Active surveillance of FMD is foreseen in the new programme, especially in places where there is a major concentration of animals (souks, markets, abattoirs and oases) and this could be carried out jointly for sheep pox and FMD. A serological survey for FMD antibodies, including detection of the antibodies to the protein 3ABC by ELISA, is also foreseen to monitor vaccination campaigns and verify whether the virus continues to circulate in small ruminants. The meeting also recommended that a vaccine/antigen bank should be set up before deciding to stop preventive vaccination and that a coordination unit of the regional FMD programme should be established.

A tool for decision-makers and an “energizer” for the National Animal Disease Surveillance Systems (NADSSs)

The experience gained from implementing National Animal Disease Databases, using TADinfo in Morocco, Algeria and, recently, in Tunisia and the Libyan Arab Republic, as a tool for CVOs and other decision-makers to manage their animal health situations, may be described as follows:

**TADinfo as a national database**

- TADinfo was needed by all the countries, since it fills a major gap. It is designed in such a way as to store continuously information generated by NADSSs. It answers a real need, identified by those responsible for data handling in these countries. None of the countries has had a continuous and permanent national database. Previously, selected data were mainly processed using spreadsheets to produce reports or to answer some specific questions.
- TADinfo is a user-friendly programme. The trained operators were able to use it very rapidly after beginning their training and rapidly gained confidence with its use.
- The programme makes use of data from different sources that are normally generated by any disease surveillance system, and allows the production of comprehensive information.
- The programme is able very quickly to produce outputs, reports, etc., that could be used by decision-makers. These can be exported to other file formats and it is possible to select data from the database and export them in different formats for further use or analysis.

**TADinfo as a part of a disease surveillance system**

TADinfo may serve as a motor to improve the functioning of the NADSSs and the quality of the reporting of disease events in the countries. This will reinforce the coordination role of the Epidemiology Unit within the system. How could this be done?

- The outputs produced using TADinfo will sensitize more decision-makers about the importance of having a strong disease surveillance system. In addition, some of the information could be used as feedback to the network partners, which will encourage them to report.
- While processing data into the database, the operators are obliged to verify the data they are entering, their quality and coherence. If data are not coherent or are incomplete, operators should contact the data/report originator to correct or complement the information.
- Even at the central level, experience has shown that some information is incomplete, not up to date or even not available at all. Having an operational national database will help gather and centralize this information in one place and make it quickly available, when needed.
- *Disease reporting forms*: with the exception of Algeria, where the disease reporting
forms are epidemiologically meaningful (i.e. contain necessary data that could be used to analyse the epidemiological situation), the disease reporting forms in use in the other countries give summarized information on disease events, whereas TADinfo needs outbreak information at the local level. All the countries are conscious of the importance of changing their reporting forms and adopted the RADISCON Disease Outbreak Report (RADDOR) and RADISCON Monthly Report as the national forms to be used. The deployment of these new forms has started, but needs time to be implemented countrywide, which may delay the complete functioning of the databases.

**TADinfo is a geo-referenced database, yes, but ...**

In order to have a real geo-referenced database, it is very important to verify the geo-references of some of the villages/localities that are already stored into the database and correct them if needed. In addition, the NADSSs should be able to produce geo-referenced data in order to feed and complete the villages/localities geo-referenced data contained in TADinfo. Therefore, the need for equipment such as the Global Positioning System (GPS) should be implemented gradually in these countries.

In conclusion, TADinfo could be a real driving force to improve the functioning of any NADSS, if its operators are given all the support needed and the full responsibility to gather, follow up and verify data from the different partners of the network. This will help to make the best use of the software capabilities and will assist CVOs and other decision-makers in managing the animal health situation in a more rational and scientific manner.

**Bluetongue in Tunisia**

First report of bluetongue in Tunisia

Bluetongue was clinically reported for the first time in Tunisia in December 1999 and there is no evidence of the presence of the infection before that date. The virus responsible was isolated and identified as serotype 2.

Twenty-four serotypes of the virus have been identified worldwide. The virus is present in a wide band of countries, between 40°N and 35°S where certain midges of the genus *Culicoides* are present to act as vectors. However, clinical disease with confirmation of virus isolation has been observed in only a few countries, possibly because of poor recognition of the disease and its association with other diseases, such as contagious ecthyma.

Clinical surveillance of the disease in Tunisia has been extended to the whole country, in the abattoirs and in animal markets. Professionals who have been trained to recognize bluetongue are also requested to make visual surveillance of the disease during vaccination campaigns. A retrospective study will take place on serum collected before 1999, which is available in the serum bank of the Tunisian Veterinary Research Institute (IRVT). The objective is to study the presence (or not) of bluetongue infection in the country prior to the occurrence of the clinical disease.

Serosurveillance will take place on the animal population that is susceptible to bluetongue, in order to determine the prevalence of the disease and its distribution. It is very important to measure the extent of the problem so as to be able to reorient the control programme, such as a better focus of the vaccination programme.

An inventory of *Culicoides* species present in Tunisia, as well as their geographical distribution, ecology and biology, will be studied exhaustively. Trials will be performed to isolate the virus from the vector.

Tunisia intends to vaccinate the ovine population using an attenuated live vaccine (serotype 2). The vaccination period will take place after the first half of pregnancy and the vector activity. This vaccination programme will be readjusted according to the results of the surveys and the vector study.

(Source: Animal Disease Surveillance System of Tunisia, February 1999.)
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