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An Update on Transboundary Animal Diseases in the Near East

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I. Introduction

1. The Near East countries are classified as developing countries and, with just a few exceptions, are net importers of food. The region is characterized by high population growth, low and erratic rainfall, limited areas of arable land, and limited water resources for irrigation. The livestock sector – poultry, sheep, goats and cattle – plays an important role in the economics of the region, accounting for 30 to 60 percent of the value of total agriculture output. However, despite the region's enormous animal population (25.5 million cattle, 290 million small ruminants, 4.5 million camels and 2 100 million poultry), many countries are still dependant on imported animals and animal products to meet their food needs. Furthermore, intraregional trade is still weak.

2. Transboundary and endemic animal diseases are considered the greatest impediment to the region's agricultural economy. Under the prevailing production systems, animal diseases are usually spread by trans-human and pastoral movement, but disease is also spread through the trade-associated movement of livestock and imports from infected third countries.

II. The Status of Animal Health in the Near East

3. The most common transboundary animal diseases (TADs) in the Near East include: foot and mouth disease (FMD), peste des petits ruminants (PPR), pox diseases and blue tongue (BT). Zoonotic diseases also include highly pathogenic diseases such as avian influenza (HPAI), Rift Valley fever (RVF) West Nile fever (WNF), brucellosis and Old World screwworm (OWS).

Avian Influenza

4. HPAI, resulting from A/H5N1, was first reported in Iraq and Egypt in February 2006 and subsequently in other countries of the region. At present, H5N1 is now endemic and widespread in poultry only in Egypt. No HPAI outbreaks have been reported in other countries of the region during the last two years. This represents a significant change in the epidemiological situation from 2006. In Egypt, in 2007 reported outbreaks in poultry were 281 and cases of human infection numbered 25; in 2008, the respective figures were 121 and eight; in 2009, 167 and 39; and in the first quarter of 2010, 225 and 17. Indeed, although the number of reported cases of human infection has increased, by 2009 the proportion of human deaths from H5N1 had decreased. Based on experience in other countries, sporadic cases and associated human deaths will continue to occur as long as the virus continues to circulate in poultry. Unfortunately, these cases have high visibility, both in national and international communities and negatively impact on Egypt in a myriad of ways.

5. Thanks to emergency strategies and intervention, risks to animal and public health have been somewhat reduced. Now, however, Egypt must move from emergency response to sustained risk reduction. Longer-term strategies and action designed to bring about sustainable control of HPAI in poultry are required to reduce threats to livelihoods, food security and public health. These strategies will require decisive commitment from national and sub-national authorities. In this regard, an integrated risk-reduction, animal health and livelihood strategy was developed using a fully participatory approach involving all relevant Egyptian stakeholders. The strategy advocates – among other things – the full engagement of community and industry partners.

Foot and Mouth Disease

6. FMD occurs in many countries in the Near East. Sheep and goats play a central role in repropagating the disease cycle in the region, creating a high risk of the disease migrating across national and regional borders to new areas. In 2005, the Near East was hit by two different serotypes: a serotype-A epidemic first struck the Islamic Republic of Iran (the so-called "type A Iran 05" epidemic) and later affected countries to the west; an African serotype A virus reached Egypt in 2006, causing widespread outbreaks. In 2007, a second strain – the O Pan Asia II type – hit almost all the countries within the area bounded by Pakistan, Kazakhstan, Turkey and Egypt.

7. More recently (2009), a second wave of A Iran 05 (BAR-08 lineage) spread across the region, involving Libya, Bahrain, Kuwait, Iraq, Turkey, Lebanon, and the Islamic Republic of Iran. This was followed by a widespread type O epidemic in early 2010. Vaccination is used by most countries of the

region to control FMD and FAO provides guidance in this field to member countries, largely via roundtable meetings held every 12-18 months and through the bi-annual reassessments of vaccine suitability carried out by the European Commission for the Control of Foot and Mouth Disease (EuFMD) and FAO. However, the vaccination programmes often have limited effects when it comes to preventing epidemics. This is partly because coverage may not be as widespread as claimed and partly because of the often dangerous dynamics of trade and transboundary animal movement across the region.

8. The FAO approach to the long-term control of FMD is to promote the application of the Progressive Control Pathway (PCP) system at country level, within the framework of a regional roadmap. The PCP programme helps countries to develop policy, set targets, manage programmes and monitor progress in achieving milestones in prevention and disease management systems. Countries in the region are encouraged to adopt the PCP risk management approach to set out their national strategies and annual targets in the fight against FMD.

Peste des petits ruminants

9. PPR, the small ruminant disease, continues to spread, affecting many countries in the region, with a significant impact on the livelihoods of rural communities. Recently, there have been serious epidemics in Saudi Arabia, Jordan and Iraq and the disease has now become widespread in the region, with reports of outbreaks in the Islamic Republic of Iran, Kuwait, Lebanon, Oman, the United Arab Emirates, Yemen and Turkey. There had been no reports of the disease in the Maghreb until July 2008, when outbreaks appeared for the first time, spreading throughout Morocco over the course of only a few weeks. The Moroccan PPR (virus PPR V) strain is very closely related to viruses found earlier in Saudi Arabia and in the Islamic Republic of Iran and differs significantly from the three other lineages previously found in Africa. Recently, the Middle East PPRV strain was found in Sudan, while PPR antibodies were detected in Tunisia.

10. Effective regional control of PPR is considered to be an essential element in any overall support programme for the improvement of rural livelihoods in the region. This is indispensable, not only to improve productivity and food safety, but also to enable smallholders to access both domestic and regional markets.

11. As part of a global strategy for the prevention and control of PPR and other small ruminant diseases, FAO plans to assist member countries through: (i) development of disease-control strategies based on epidemiological surveillance, risk assessment and socio-economic impact analysis; (ii) strengthening of national capacities in the prevention and control of PPR, with priority given to small-ruminant transboundary and zoonotic diseases; and (iii) establishment of sustainable regional coordination and harmonized policies for disease surveillance and management, as well as safe trade in animals and animal products. A regional Technical Cooperation Programme (TCP) on the surveillance of PPR in North African countries is currently in the pipeline.

Brucellosis

12. In many countries of the region, brucellosis continues to be reported in almost all domestic animals, particularly sheep, goats and cattle. This infection is transmissible to man, and can have a dramatic impact on livelihoods and public health. It causes abortion storms in goats and sheep and Malta fever in humans, affecting the rural population and dairy product consumers. This becomes increasingly serious with the explosion of urban and peri-urban agriculture. Brucella melitensis is the most commonly isolated species, particularly in small ruminants, but Brucella abortus is also being reported in cattle in much of the region. In recent years, a growing number of countries have reported the existence of brucellosis in camels.

13. From 10 to 500 new cases of human brucellosis per million people are reported and registered annually in the region. Some countries in the region rank among those with the highest number of new cases each year worldwide. Most human cases are caused by *Brucellosis melitensis*, particularly Biovar 3. Currently, a number of countries are running brucellosis control programmes in small

ruminants, using the *B. melitensis* Rev1 vaccine. Vaccination strategies, however, vary considerably in terms of vaccine doses and routes of administration used: e.g. bi-annual or annual; vaccination of only females or both males and females.

14. In large ruminants, brucellosis control strategies again vary considerably. In some countries, the test and slaughter policy with the vaccination of young females is adopted, while in others overall vaccination is the method of choice. The most commonly used vaccine is *B. abortus* S19. Vaccination with the *B. abortus* RB51 vaccine was introduced recently on a small scale in some countries. However, test and slaughter schemes are only practical if and when prevalence is significantly low and compensation programmes are in place. Although attempts have been made to harmonize brucellosis surveillance and control methods, there is currently no regional coordination system.

Vector-borne diseases

15. Vector-borne diseases such as BT, RVF and WNF are also threatening the region. The BT virus has recently expanded its geographic range and remains a source of concern throughout the region because of the wide range of virus serotypes that could easily spread across national and regional borders. Serotype 8, introduced in 2006 in northern Europe, has spread now to southern Europe (Spain, Portugal, and Italy) and is threatening those southern Mediterranean countries where Serotypes 1 and 4 are already circulating and where targeted vaccination programmes are implemented. Surveillance of Serotype 8 and other BT viruses is recommended in these countries.

16. RVF remains a significant zoonotic threat in most countries of the Middle East. It is endemic in most of sub-Saharan Africa, but until 1997, the farthest north that RVF outbreaks were reported were in the Sudan in 1973, 1976 and 2008, and in Egypt in 1977-1978 and again in 2003. During the 2003 outbreak in Egypt, 45 cases of the disease were reported in humans with a high rate of encephalitis that resulted in 38 fatalities. It was speculated that the disease was introduced into Egypt from north-central Sudan by diseased sheep transported by boat along Lake Nasser, where potential mosquito vectors are abundant. Livestock trade has also been blamed for the introduction of RVF into the Arabian Peninsula in 2000, when RVF broke out simultaneously in Saudi Arabia's Jazan Province and in adjoining Yemen. Since then, RVF serological evidence without clinical manifestation was reported in 2004, 2007 and 2008. More recently a few outbreaks were reported in cattle and sheep, again in the Jazan Province. In 1987, 1993 and 1998, severe epidemics affected southern Mauritania, with at least 232 human deaths reported. Low levels of seroconversion are still being reported by ongoing monitoring in the valley and, from time to time, in the more arid areas of southern Mauritania, confirming that the disease is now endemic there.

17. WNF is a common cause of viral aseptic meningitis or encephalitis in patients brought to emergency rooms in Egypt. In Maghreb countries, WNF is not always included in routine surveillance protocols and therefore data are incomplete. In Morocco, however, outbreaks in horses were reported in 1996 and 2003 in the irrigated areas of the northwest with, respectively, 92 cases (42 of which were fatal) and nine cases (with five deaths). The theory is that the disease was introduced from endemic areas in West Africa by migrating wild birds attracted by the area's abundant mosquito populations. Furthermore, in 2005-2006, the WN virus was discovered in pelicans tested during wildlife surveillance campaigns against avian influenza (AI). This showed the degree to which Morocco and other countries in the area are vulnerable to this disease. In Algeria, serological evidence has been reported in humans and donkeys in various surveys. Tunisia was seriously affected by WNF outbreaks in 1997 and again in 2003, with respectively 173 and 31 human cases (with eight deaths occurring in 1997). Both epidemics occurred in the central east part of this country. It should be noted that the virus isolated in Tunisia belongs to the same lineage as the virus isolated in Morocco. More recently, serological surveys conducted between 2005 and 2009 on horses and donkeys confirmed the virus continues to circulate in Tunisia, Morocco and Mauritania.

18. FAO has been responsible for advancing practical knowledge and experience related to brucellosis control and surveillance and in assisting a number of countries in the region in the development of sound strategies and policies designed to introduce sustainable control programmes that would lead to a regionally-coordinated approach to brucellosis control.

Other diseases

19. Infestation by the OWS fly is another problem. *Chrysomia bezziana* is a transboundary zoonotic agent of direct relevance to most countries of the Arabian Peninsula. The 2008 and 2009 OWS events in Yemen provide evidence that this disease agent is spreading progressively into high risk areas of the region. Incursions of OWS were reported in Oman in 1983, in the Islamic Republic of Iran in 1994, in Iraq in 1996, in Bahrain and the Gulf countries in 1997 and in the United Arab Emirates in 1998. Such proliferation is related to a combination of factors, including the movement of people and livestock, land use and climatic change. In 2008 and 2009, Yemen requested FAO assistance in order to evaluate the OWS epidemiological situation in that country, as well as to contain OWS outbreaks. FAO, together with the International Atomic Energy Agency (IAEA) and the Arab Organization for Agricultural Development (AOAD), provided technical support, mainly in risk assessment and entomological control systems. In addition, training materials for the national veterinary services, in the form of technical aids related to screwworm fly ecology, behaviour and control, as well as OWS risk maps, were made available to national technical staff.

20. More recently, an outbreak of Glanders disease was reported from Bahrain, affecting horse stables throughout the island. Glanders is a highly contagious and potentially fatal bacterial infection of equines that can be transmitted to humans who have direct contact with infected animals or contaminated objects. The outbreak in Bahrain forced veterinary authorities there to use aggressive measures, including restrictions on animal movement, sequestration, widespread testing and culling of infected horses. The disease seems to have been introduced into the country through imported horses from neighbouring countries, suggesting that it is probably present in other nearby countries but not yet notified to the World Organisation for Animal Health (OIE). Glanders is not solely a concern for horses; it is a zoonotic disease that can cause rare but serious infections with a high mortality rate in humans. Countries with suspected cases would need to conduct targeted surveillance programmes in order to detect infected horses or donkeys, to limit disease spread and to reduce the risk of possible transmission to humans.

III. Review of Animal Health Programmes in the Region

21. In recent years, FAO has strengthened the animal health programme in the Near East through the establishment of decentralized units of the Emergency Centre for Transboundary Animal Diseases (ECTAD). These units are located at the OIE/FAO Regional Animal Health Centres in Beirut (for the Middle East) and in Tunis (for North Africa). The latter can be found at the Sub-regional Office for North Africa. Owing to the intense AI programme in Egypt, a specific country ECTAD unit was established at the FAO Regional office for the Near East in Cairo.

22. In the face of the AI crisis, FAO has developed and implemented an Action Plan for HPAI preparedness and response in the Near East and strengthened the region's veterinary services through human capacity building, laboratory and field equipment, supplies and physical resources, hence creating capacity to respond to potential/actual outbreaks of HPAI and other TADs.

23. FAO has provided technical assistance to member countries seeking to finalize their applications for accreditation of rinderpest freedom, according to the OIE PCP. Assistance in carrying out the required surveillance for rinderpest-freedom accreditation has been specifically provided to some countries and indeed twelve countries in the region are now recognized as officially free from rinderpest, with only two countries (Saudi Arabia and the United Arab Emirates) still in the final stages of the process.

24. In February 2010, all countries of the region received a questionnaire from FAO/OIE/IAEA on rinderpest virus handling and responsible custodianship, aimed at decreasing the likelihood of virus escape. Few questionnaires have been returned as yet, but countries have been requested to destroy rinderpest-containing samples or submit them to the Pan-African Veterinary Vaccination Centre of the African Union (AU-PANVAC) or to the Pirbright World Reference Laboratory. In addition, FAO has made significant efforts to advance practical knowledge and experience in prevention and control of other TADs and zoonoses in the various countries of the region. These diseases include FMD, PPR, RVF and brucellosis.

25. Currently, all countries of the region are running disease control programmes, with a combination of control measures supported by surveillance activities. However, these programmes are fragmented, are not supported by reliable epidemiological information and are usually implemented on an ad-hoc basis. Although attempts have been made to harmonize surveillance and control programmes, any real regional coordination is still lacking.

26. Despite these efforts and the considerable experience gained during the AI crisis, there remain significant challenges and lacunae in the prevention and control of priority TADs and zoonoses in the region. Therefore, there is an urgent need to develop additional joint collaborative activities in a strategic context that set guidelines to strengthen national and regional capacities and reinforce mechanisms for regional coordination and inter-sectoral collaboration. This is essential if the countries of the region are to be able to detect, notify and respond rapidly and effectively to existing and emerging animal diseases of national and international concern.

IV. FAO Strategy for the Control of Animal Diseases and Zoonoses

27. Recent consultations between member countries and key stakeholders in the region have resulted in a Regional Animal Health Strategy for the Near East. The proposed strategy builds on guidelines contained in the FAO/OIE Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs), and draws on other tools such as the FAO Global Early Warning and Response System (GLEWS) and the OIE/FAO Network for Expertise in Animal Influenza.

28. The Near East strategy is in alignment with the "One Health" initiative that embraces a holistic approach to the prevention and control of diseases in the animal-human-ecosystem interface. The idea is to use this strategy to guide the development and strengthening of the capacities of national veterinary services, thereby enabling them to safeguard animal health and livelihoods from the threat of existing and emerging diseases and mitigate the risks for humans arising from animal sources. The strategy will be used also as a framework for the development of stronger collaboration, both between countries and with regional and global networks and other technical partners. It is essential to build a regional safety net for the Near East that will protect against all those existing and emerging diseases that have a serious impact on human and animal populations.

29. The vision of the Animal Health Strategy for the Near East is to safeguard animal health and livelihoods from the threat of infectious diseases and mitigate the risks to public health arising from animal sources, in line with the FAO "One Health" approach. The goal of the strategy is to increase food security and improve the livelihoods of small-scale livestock holders.

30. Four objectives were proposed to achieve these strategic goals:

- improve the capacities of veterinary services in the effective control of animal diseases and zoonoses;
- enhance regional cooperation in animal disease surveillance, disease management and disease-free trade in animals and animal products;
- ensure a high level of public and food safety by effective risk management of zoonoses and food-borne diseases; and
- promote partnerships and applied research.

For each objective, a number of expected results are specified, all of which are supported by action plans. Six project profiles were elaborated:

- enhancement of policies and strategies for surveillance and control of transboundary animal diseases in the Arabian Peninsula;
- strengthening coordination of animal disease control and surveillance among Middle Eastern countries;
- strengthening coordination of animal disease control and surveillance among North African countries;
- control and eradication of PPR and sheep and goat pox;

- improvement of the capacities of the countries of the region in the diagnosis and management of camel diseases; and
- establishment of a coordinated regional approach for more effective and sustainable control of zoonoses in the Near East, with particular reference to brucellosis.