The OIE contribution to the control of horse diseases*

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Summary: Informing OIE Member Countries with regard to the evolution of the main contagious animal diseases, and harmonising zoo-sanitary regulations, make up the principal functions of this organisation.

In the field of equine pathology, seventeen notifiable diseases are taken into consideration in the information system. They have to be reported to the OIE in case of new outbreaks and require strict surveillance during international exchange.

The author analyses the epizootiologic situation and the principal control measures for five equine diseases from data regularly transmitted by the Veterinary Services of Member Countries: African horse sickness, equine infectious anaemia, Venezuelan equine encephalomyelitis, contagious equine metritis and influenza.

The major sanitary risks to which racehorses, and horses used in sport, are exposed can be reduced by readily available sanitary information and rapid, concerted action.


Founded in 1924, the Office International des Epizooties (OIE) is an intergovernmental organisation, at that time essentially devoted to the coordination of control of highly contagious animal diseases. France was instrumental in creating the Organisation, following reports from Belgium indicating that rinderpest had been diagnosed in Pakistani cattle in transit in the port of Antwerp. Among the objectives set by the twenty-eight founder countries were the mutual exchange of information on the animal health status in each country, combination of knowledge and coordination of research in an effort to ensure effective disease control and to avoid disease spreading beyond national frontiers through trade activities.

Another aim was to harmonise health regulations used in animal trade. For this, a book of recommendations was drafted and later adopted in 1968, in the form of the "OIE International Zoo-Sanitary Code".

In the opening pages the Code states what is required of Member Countries and the OIE Central Bureau in the field of disease reporting. This document therefore provides the basis of the OIE information system. Accessible information on the

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disease status is obviously a pre-requisite when trading in animals and animal products. Article 1.3.1.1. of the Code (1) stipulates in particular that:

"The following should be considered...

1. Information on the animal health status and the national animal health information system in order to determine whether that country is free or has zones free of List A diseases.

2. Regular and prompt information on the presence of contagious diseases, in particular those mentioned in Lists A and B..."

List A comprises highly contagious diseases considered to pose the greatest threat to international trade. List B includes those diseases which are of a less contagious nature but which should also be taken into consideration for trade purposes.

Seventeen diseases affecting horses are found in these two Lists, namely:

African horse sickness, contagious equine metritis, dourine, epizootic lymphangitis, equine encephalomyelitis, equine infectious anaemia, equine influenza (virus type A), equine piroplasmosis, equine rhinopneumonitis, glanders, horse pox, infectious arteritis of horses, Japanese encephalitis, mange, salmonellosis (S. abortus equi), surra, and Venezuelan equine encephalomyelitis.

However, the Code is essentially a guide for Veterinary Services, to assist in the setting of health requirements when importing and exporting animals and animal products. The advantage of the Code is that it offers substantiated scientific solutions to problems encountered in international trade. These practical solutions can be used by both importing and exporting countries, depending on the prevailing health status in both countries.

A series of recommendations is also given for health requirements for transport from the farm or place of origin to the final destination of the animals. OIE experts liaise with the Collaborating Group responsible for the international transport of animals of the International Air Transport Association (IATA).

Finally, the Code proposes methods to follow when testing animals for List A or B diseases. It is important that all countries "speak the same language" and that tests are performed in the country of origin in the same manner as in the country of destination. Diagnostic methods are standardised by the OIE Norms Commission, as are techniques for the preparation and control of biological products which may be administered to animals pre-export.

It would not be possible here to discuss and analyse all the Code Chapters devoted to horse diseases but rather a selection is made, giving horse diseases of particular importance to international trade. Among diseases which have caused difficulties are: African horse sickness, infectious anaemia, Venezuelan encephalomyelitis, contagious metritis and influenza.
AFRICAN HORSE SICKNESS (AHS)

Until AHS was discovered in the Middle East in 1959-1960 (apart from some cases beyond the Red Sea), the disease had remained confined to Africa, South of the Sahara. Low mortality is recorded in these enzootic areas. However, in previously non-affected regions, serious epizootics have been noted, with at least 300,000 animals dying from the disease in the first phase of the outbreak in the Near East and in South West Asia. Consequently, great concern was voiced by members in this field, from Europe in particular, when AHS spread to the Maghreb countries (Algeria, Morocco and Tunisia) in 1965.

The emergency meeting on AHS held in January 1961 at the OIE Headquarters in Paris, established a series of measures to be used against the disease. All countries which wished to protect their horse industry banned the entry of equines from infected countries (a measure recommended by the Code). This ban was very effective for the more remote countries, as they were out of the range of the insect vectors, but Spain, on the contrary, was contaminated from the Maghreb area in October 1965. Due to immediate and energetic measures taken by the Spanish Veterinary Services following consultation with the OIE, the disease was eliminated rapidly and on 1 February 1967 Spain was once more considered as totally free of AHS.

The last outbreaks reported in the Maghreb date back to June 1967.

A round-table conference was organised at the OIE on 26 and 27 May 1971, chaired by Dr. Mirchamsy of the Razi Institute in Iran. Four years had elapsed without a new case being recorded in North Africa, despite a resumption of imports of European horses with no disease history. Consequently, the experts considered that the virus had been eradicated from previously infected areas. This opinion concurs with the clauses of the Code which stipulate that:

"... a country may be considered free from AHS when no case has been confirmed for the past two years and when no vaccination against the disease has been carried out during that period; in addition, the country concerned has not imported any equine animals from any country where the disease has been confirmed during the previous two years and/or where vaccination against the disease has been carried out during that period."

A number of countries, among them France, resumed normal trade relations in regard to equine animals with Maghreb countries without experiencing any problems of a disease nature, hence further confirming the suitability of measures advocated by the Code. The Code also provides for imports of horses from countries in which AHS is present. Such a possibility could not be envisaged by a free country if the horses from the infected country were virus carriers.

This was put before a group of experts at a special meeting held at the OIE Headquarters on 21 July 1972. The group replied that the horses would not be carriers, as the viraemia stage usually lasts between seven and nine days in the diseased animal and the virus disappears rapidly in a cured animal.

The movement of horses from countries considered infected is therefore possible, under conditions stated in Article 2.1.11.6. of the Code (1), namely:

— choice of the season when insect vectors (culicoides) are not active;
— insect-proof quarantine for 40 days (duration of the maximum incubation period); and
two complement fixation tests giving negative results, carried out at an interval of at least 21 days and not more than 30 days.

With the 1988 Seoul Olympics in view, a report on horse diseases was presented at the 53rd OIE General Session in May 1985. This draws the attention of the OIE Committee to the provisos of the Code and in particular those devoted to AHS.

EQUINE INFECTIOUS ANAEMIA (EIA)

EIA is generally a chronic disease which mainly affects horses. The new dimensions taken by EIA in 1966 in a number of European centres for competition horses encouraged the OIE to place EIA on the agendas of the OIE Code and Norms Commissions.

Initially, the Code provided the following for horses admitted in international trade:

"i) on the day of exportation the animals showed no clinical sign of EIA;
   ii) no case of EIA has been reported in the premises where the animals were kept during the three months prior to exportation."

However, these guarantees appeared inadequate as EIA-infected animals could be a source of the disease even though they did not present any clinical symptoms, at least at some stages of disease evolution. It was therefore important that a diagnostic method be recommended for the detection of animals with chronic infection. The Coggins test was introduced into the Code for this purpose, following the 3rd Meeting on Horse Diseases held in Lyons in 1977 at which the OIE had discussed the problem with experts in this field.

According to the Code, the test should be practised during the 30 days prior to exportation. This requirement is difficult to meet when dealing with competition horses which are transported frequently. For this reason, horse racing authorities prefer a periodic test, for example each year.

The Code recommendation can be relaxed in this way, depending on the bilateral agreements and on the knowledge of the prevailing health conditions in each partner country. Equestrian organisations should work closely with the veterinary authorities to allow for methodical surveys to be made on horse populations which are often grouped together in training centres and race courses and from which sick animals could be eliminated, should this prove necessary.

For purpose of international trade, the standardised Coggins test is given in Appendix 4.4.3.1. of the Code (1):

"With a view to harmonisation of the interpretation of results obtained in various countries, laboratories performing this test should use a reference serum to check the sensitivity level of their technique. This reference serum is sterile, heat treated and freeze-dried. It is prepared by the Reference Committee..."

This Committee includes the National Institute of Animal Health in Tokyo for Asia and Australia, the Veterinary Services Laboratories, USDA, in Ames (Iowa) for the Americas and the Veterinary School in Maisons-Alfort (France) for Europe and Africa. In this way technical guarantees ensure the satisfactory health status of equines and consequently the safe circulation of horses.
VENEZUELAN EQUINE ENCEPHALOMYELITIS (VEE)

VEE is a serious zoonosis affecting both man and horses, but which presents a complex epidemiology endangering a multitude of animal species (equines, ruminants, pigs, carnivores, bats, edentates, marsupials, rodents, birds and reptiles) as well as numerous arthropods (*Culex, Aedes, Anopheles, Psorophora, Mansonia*).

The natural foci of infection are located in humid forests in tropical America, usually in marshy areas. The major reservoirs are different species of rodents; the *Culex* mosquitoes act as vectors for transmission of the virus to susceptible animals. In favourable ecological conditions (rains, intense heat), rodents multiply and the pullulation of mosquitoes greatly increase disease spread.

The complex VEE virus has four subtypes (I to IV) in which subtype I has five antigenic variants (IA, IB, IC, ID and IE). The most dramatic epizoodemic was that of 1969, caused by subtype IB. This spread from Ecuador to Guatemala and beyond to other Central American countries and Mexico, reaching Texas, USA, in 1971. During this epizoodemic between 38,000 to 50,000 horses died, approximately 31,000 human cases were recorded, of which 310 were fatal in Ecuador alone. This explosive occurrence of the disease caused free countries to impose an embargo on imports of horses from infected countries; a measure recommended by the Code.

However, anti-vector control, on an unprecedented scale, together with massive vaccination using a modified live virus isolated in Trinidad in 1943 from the brain of a burro, later cloned and known as T-83, prevented disease spread in the south of the United States.

A year after the IB Texas episode, in May 1972, a round-table meeting on VEE was held at the OIE under the chairmanship of Professor C. Hannoun, Head of the Viral Ecology Department of the Pasteur Institute.

Experts confirmed that importing countries would be more safely protected by enforcing strict prohibition measures against imports of horses during the season when mosquitoes are active. Upon resumption of imports, the experts advocated a two-week quarantine of the animals, although the most important criterium was temperature reading throughout the observation period. In actual fact, it is only during the short viraemia phase that the horse carries the virus.

These principles are given in the Code which recommends that horses from infected countries be quarantined before export, and on arrival in the importing country, placed in isolation and observed for ten days.

CONTAGIOUS EQUINE METRITIS (CEM)

In 1977 CEM was identified in thoroughbreds in England, Ireland and Australia. Later, in 1978, the USA, France, Belgium and the Federal Republic of Germany also reported cases, as did Japan in 1980.

In May 1978 the OIE organised a meeting of specialists to examine problems caused by the disease, particularly those relating to diagnosis, spread, epidemiology and control measures. Work accomplished in this field has proved that not only can the disease be transmitted sexually but also indirectly through premises, instruments used for grooming, etc.
When stallions and mares are transported internationally, the Code recommends that an official control organisation be consulted to ensure that the animals have had no direct contact through coitus with an infected animal or that there has been no indirect contact by passing through an infected establishment. Centres or premises are considered infected if CEM has occurred within the two preceding months and if neither cleaning nor disinfection has been carried out.

The CEM Chapter of the Code has an appendix in which protocols are given for sampling for the causal agent *Haemophilus equigenitalis* in mares and stallions, conservation in transport in an appropriate medium, seeding techniques in various media and special conditions for incubation and identification.

**EQUINE INFLUENZA**

The OIE has often studied respiratory diseases of horses, but as equine influenza was not included in the diseases listed in the Code until 1983, no specific provision had been made for this disease.

However, during the Conference on *Human and animal influenzas* organised by the Alfort School in 1979, possibilities of OIE participation in activities to protect horses were mentioned. The "Société d'Encouragement pour l'amélioration des races de chevaux en France" (Society for the improvement of breeds of horses in France) appeared to be the first to have required anti-influenza vaccination for thoroughbred horses before allowing entry onto racecourses or into training centres. Vaccination is gradually being used more and more in thoroughbreds in various countries and hence the problem of the surveillance of the equine influenza virus has been raised. It is known that influenza viruses can develop through "drifting" or "fracture" and then shed doubt on the quality of immunity acquired through previous infection or through vaccination.

The OIE experts on horse diseases could then propose a double-purpose influenza surveillance scheme to the International Committee of the OIE as follows:

— to cooperate with the WHO in regard to findings on relationships between equine viruses and other viruses of different animal species and also human viruses;

— to examine viruses from equines isolated in various regions of the world, in order to study the possibilities of preparing a new vaccine without delay.

Many consultations were held on this programme and finally, through Resolution No. V adopted in May 1983 at its annual General Session, the Committee agreed to the establishment of the OIE Reference Laboratory for Equine Influenza at the Veterinary University in Munich, under the supervision of Professor P.A. Bachmann.

The late Professor Bachmann prepared a report for the 53rd General Session in May 1985 entitled "Progress Report - 1984: Equine Influenza Reference Laboratory, Munich". This report covers the following items:

1. **Comparative research on the surveillance of virus strains**
   - Typing of strains sent from Sweden and France.
   - Production of monoclonal antibodies.
   - Establishment of a strain bank.
2. Epidemiological surveillance

- Serological evidence of infection with the H3N8 subtype in coupled sera sent from France and the Federal Republic of Germany.
- Negative results from sera received from Turkey.

3. Preparation of standard reference agents for diagnosis

Reference antigens were prepared from two reference strains, namely A/equi/Prague/1/56 and A/equi/Miami/63 and were distributed to laboratories for serological diagnosis.

4. Standardisation of diagnostic techniques

Collaborative studies were initiated with the Animal Health Trust’s Equine Virology Unit, Newmarket in Great Britain (Dr. Mumford) and the Institute of Hygiene and Epidemiology in Prague (Dr. Tumova) to establish a standard protocol for demonstration of antibodies to equine influenza virus by the haemagglutination-inhibition test. A comparison of results on epidemiological surveillance and vaccination will thus be possible.

In 1983 the Committee inserted an article in the Code advising vaccination of equine animals to be transported from one country to another. However, in cases where no vaccination is practised due to absence of equine influenza, it is advised to vaccinate the animals upon arrival in the importing country. Different texts concerning the surveillance of equine influenza are being prepared, in particular the sampling technique and transport conditions to the laboratory.

A vaccination schedule has also been largely discussed by horse authorities. Special attention should be paid to the most favourable periods to perform the first vaccination and then to the intervals between the first booster and subsequent boosters. Trainers hope that these successive vaccinations can be performed without disrupting the pre-race activities of horses. It is too early to draw conclusions from experiments made on horses which have no previous EI history as results to date have been too limited. In all circumstances, however, periodic checks on immunity, as part of vaccination programmes, should offer useful data leading to significant statistical analysis.

It would therefore be necessary to have the active cooperation of the horse-racing authorities so that samples of influenza virus strains can be taken and sera collected for examination, in accordance with the instructions of the Reference Laboratory.

CONCLUSIONS

The prosperity of the equine sector, particularly in regard to racehorses and sports horses, is dependent on the ease with which trade can be conducted and the preservation of the health status of animals. These two conditions, although apparently contradictory, can be reconciled if close collaboration is maintained between official veterinary services and equestrian authorities.

The health hazards are particularly important for race and sports horses which come into contact with many other horses both in their own countries or in countries to which they are transported, in competitions, races or studs. These risks can only be avoided or at least minimised if immediate disease notification is made,
followed by rapid and concerted control activities. The rapidity and reliability of information and efficiency of activities depend on the system adopted to ensure true cooperation between equestrian authorities and veterinary services.

The example of this cooperation on a world level is given by the links established between the OIE and international equestrian authorities, such as the International Equestrian Federation, the International Conference of Horse Racing Authorities (CIAH) and the World Trotting Association. The following international conferences sponsored by equestrian authorities, most often with the OIE, should be mentioned due to the positive effects they have had on the study of infectious diseases of horses:

- 1st International Conference held in Stresa (Italy) from 11 to 13 July 1966, under the sponsorship of the National Union for the Improvement of Horse Breeds (UNIRE) (Rome) and the Grayson Foundation (Lexington, USA).
- 2nd International Conference organised by the “Société d’Encouragement” and the OIE in Paris from 14 to 18 June 1969.
- 3rd International Conference organised by the Grayson Foundation, the “Société d’Encouragement” and the OIE in Paris from 17 to 21 July 1972.
- The International Conference for the cooperation of the State Veterinary Services with the Racing Authorities, with particular emphasis on trade in the Mediterranean, held in Rome on 26 and 27 February 1981 at the UNIRE Headquarters, also deserves mention.

This Conference examined a draft agreement on zoo-sanitary regulations pertaining to the free circulation of competition horses in Mediterranean countries.

The Conference recommended in particular that Veterinary Services use an efficient system to control horse diseases and that they supply regular and prompt data on these diseases.

The Conference also confirmed the need for permanent collaboration between official veterinarians and veterinarians from the equestrian sector; an item which was also stressed at the two previous conferences.

In closing this outline of OIE activities in relation to some diseases of horses, it is hoped that research be extended in the field of information to all establishments where horses are raised or used, whether they be elite horses or common animals, and finally, that cooperation be ensured between all the associations involved (CIAH, Trotting Association, International Equestrian Federation). At the present time, with the experience and character of the OIE, this appears to be the most suitable organisation to coordinate all initiatives concerning data on horse diseases.

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REFERENCE