The CIRAD contribution to rinderpest eradication

Rinderpest, which was a major incentive for establishment of the first veterinary school at Lyon in 1764 and later of OIE, also motivated the implementation of an international training course in Maisons-Alfort (France) in 1921, which aimed to improve the control of rinderpest. This postgraduate teaching in exotic medicine was soon organized into an institute, Institut de médecine vétérinaire exotique, then, the Institut d’Élevage et de Médecine Vétérinaire Tropicale (IEMVT), which was created in 1948 and merged with other French agronomic institutes in 1984, to create CIRAD. For simplicity, this chapter uses the name CIRAD. All the scientists mentioned work at CIRAD unless otherwise stated.

The history of CIRAD’s contribution to rinderpest eradication is also the history of strong collaboration with national, regional and international veterinary services (OIE, FAO, AU-IBAR) and animal health research centres. A large and significant body of field and laboratory work was carried out during the period. A few years ago, it was still possible to meet pastoralists in remote areas of Chad or the Central African Republic who remembered seeing French vets use their goats to vaccinate cattle with the “caprinized” rinderpest vaccine.

Pan-African vaccination campaigns and the pledge for eradication

CIRAD was involved in all aspects of rinderpest research and control activities since the early 1950s. Most of this work was conducted in the national laboratories of Chad (Farcha; Provost, 1966), Senegal (Dakar) and Ethiopia (Debre Zeit; Lefèvre and Domenech, 1974), which are now important components of their respective national animal disease control and research systems. Dakar and Debre Zeit laboratories are major international stakeholders in disease control, through the networks and reference centres of the West and Central Africa Veterinary Laboratory Network for Avian Influenza and other Transboundary Disease (RESOLAB, coordinated by FAO, OIE and AU-IBAR) and PANVAC (coordinated by AU-IBAR).

Starting in the 1950s, CIRAD teams worked throughout large areas of Africa, disseminating use of the caprinized rinderpest vaccine developed in India by Edwards (IVRI, Mukteshwar) in 1920. In the early 1950s, Plowright (IBED, Muguga, Kenya) attenuated a strain of rinderpest virus by serial passages of a wild virus on cell culture (Plowright and Ferris, 1959). From 1953, CIRAD engaged in the production and dissemination of this new vaccine (Mornet, Gilbert and Mahou, 1957).
Following the reoccurrence of rinderpest in western and eastern Africa in the late 1970s, after the conclusion of JP15, an emergency West African campaign was launched in 1981, managed by Yves Cheneau and funded by EDF. At the same time, Alain Provost advocated for the funding and implementation of a pan-African rinderpest vaccination campaign. With the support of Louis Blajan, Director-General of OIE, he was able to convince Jan Mulder, head of EFD in Brussels, to support this idea, which was also accepted by the African nations. During an OIE/FAO/OAU-IBAR joint meeting in Paris in February 1982, Alain Provost drew a parallel between rinderpest and smallpox, and expressed the idea that rinderpest eradication was achievable with the scientific knowledge and technical expertise that was available (OIE, 1982).

**CIRAD’s scientific involvement in rinderpest eradication**

CIRAD scientists have published more than 500 scientific articles, communications and notes on rinderpest, from Curasson in 1932 to today (the number rises to 750 if articles on peste des petits ruminants are included). In collaboration with African colleagues, veterinary schools, the Pasteur Institute and IAH Pirbright Laboratory (United Kingdom), these scientists have contributed to the scientific foundations for success of PARC and PACE, and to the OIE Pathway for rinderpest eradication. For instance, CIRAD contributed to the finding that wildlife was a victim of, but not a reservoir for, rinderpest virus, and that wild animal populations could be used to monitor and certify the disappearance of rinderpest from the African continent (Couacy-Hymann et al., 2005; Kock et al. 2006). CIRAD scientists also suggested that peste des petits ruminants was helping prevent the dissemination of rinderpest. Important advances were made on improved thermo-stability of vaccines and new recombinant vaccines, and on the development of diagnostic tests for virus or antibody identification. Rinderpest and peste des petits ruminants viruses are the only representatives of the *Morbillivirus* genus whose host ranges overlap, and are strikingly similar in terms of the clinical signs they induce. Thus, to be fully effective in determining the causative agent in an outbreak, particularly in small ruminants, laboratory tests had to be sensitive and specific and provide quick results to confirm clinical suspicions. The combination of modern immunology and molecular biology techniques allowed CIRAD to develop diagnostic tests in a kit format (Diallo et al., 1995; Libeau et al., 1995), which was routinely used by the national veterinary laboratories involved in PARC and PACE.

Innovative concepts and methods have always been central to the work of IEMVT and CIRAD, and collaboration with African partners led to a knowledge-based control of rinderpest. This collaborative work illustrates how science-based control programmes, coordinated at the regional and global levels and appropriately funded by international donor support, can be successful and generate high economic returns. Rinderpest eradication should be considered an example for the control of other major animal and zoonotic disease agents with major impacts on food security and public health.

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