

Cattle plague wiped away

A virus that single-handedly altered the ecological balance of the African continent by obliterating 90% of the cattle along with other members of the fauna, is finally on the verge of being wiped-off from the face of earth. The global scientific community is close to making a global declaration of rinderpest eradication. The disease spread along the west to the Atlantic and east to the Pacific. Rinderpest has for long been known as the disease of war¹.

Rinderpest is the German word for a disease, caused by a virus known in English as cattle plague. Rinderpest was known as 'Steppe murrain', since it was thought to have originated from the Steppes between Europe and Asia. It is a highly contagious viral disease of cattle, domestic buffalo, and some species of wildlife. The *Morbillovirus* belongs to Paramyxoviridae, a family of single-stranded RNA that is known to cause canine distemper and human measles². The virus is known to spread through infected droplets of the breath and excretion of the diseased animal. It is usually introduced by infected goat or sheep, with catastrophic effects in susceptible cattle. Though it is susceptible to heat and humidity, the virus is known to remain viable for longer period in cold conditions³. Transmission occurs predominantly through direct contact with excretion (urine, blood, tears, faeces, saliva and nasal infections) of infected animals, although the disease can spread through several additional routes as well^{2,4}. However, the virus is not known to infect human beings.

Clinical signs in animals differ on the basis of the strain of virus and susceptibility of the host. During the earlier stages the animal exhibits symptoms such as high fever (6–9 days) after infection followed by anorexia and diarrhoea with inflammation of the mouth, nasal cavity, and other mucosal membranes. Severe salivation turning purulent along with the necrotic lesions occurs throughout the gastrointestinal tract. Death occurs 6–9 days after the appearance of the symptoms. In rare cases, symptoms regress and the animal recovers within 25 days. These animals are considered immune and live long³.

Rinderpest is enzootic in parts of eastern Africa, India, Pakistan and Sri Lanka,

where it may cause only mild or inapparent infection. It has been around since the Middle Ages and has devastated buffaloes and cattle over a period of time. Europe has been afflicted with the virus since the 17th century during the times of war. A shipment of live cattle from the Indian subcontinent to England wrecked havoc, leading to cattle plague during 1865–67 that denuded Europe of all cattle. In 1889, the virus entered Africa via infected cattle from India, that were shipped for the Italian army¹. Wild populations of buffalo and giraffe were annihilated by the virus in Africa. Loss of cattle as well as wildlife led to a mass-scale starvation that wiped-off one-third of Ethiopia's population⁵.

To counterattack the rinderpest pandemics in Africa, the Organization of African Unity was established in 1962 with the launch of the Joint Project 15. It worked with the objective of vaccinating cattle each year for three consecutive years. The vaccination programme that spanned over 22 countries, was a success. However, many countries failed to adhere to this strategy due to the expensive surveillance programmes and the project was terminated resulting in the resurgence of the disease a decade later in the 1980s. Rinderpest re-established itself from two foci – the Mali-Mauritania border and from southern Sudan. Two million cattle were inflicted with the disease and half-a-million died in Nigeria. This led to a disastrous consequence of high rate of suicides among herders. The Sudan outbreak eventually invaded Uganda and Tanzania, taking a toll on the wildlife as well. The prevalence of the pandemic led to a new campaign. The result was the Pan-African Rinderpest Campaign that became operational in 1987 in 34 African countries¹.

Rinderpest struck Asia from Bangladesh to the entire Middle Eastern region due to lack of surveillance agendas. As a result, regional campaigns were launched in the affected nations. A major breakthrough in the eradication of the virus was FAO's initiative – the Global Rinderpest Eradication Programme (GREP) – to exterminate the virus by 2004, followed by surveillance to confirm that the virus was wiped out by 2010. GREP was backed by FAO, OIE (Office International des Epizootics) and IAEA

(The International Atomic Energy Agency)⁶. To be certified as rinderpest-free, the Paris-based organization for animal health insists that the countries should have stopped vaccination for a minimum of two years and not witnessed any incidence of the virus⁵. An adherence to the OIE pathway is mandatory for countries to rid themselves of rinderpest⁷.

Immediate measures to stem the spread of the disease were taken. Quarantine and ring vaccination were practised for control of the virus. The only feasible measure was vaccination since it induces a protective antibody response, making the animal immune to later infection. A key discovery in rinderpest research was during 1956, when virologists W. Plowright and R. D. Ferris cultured an attenuated rinderpest virus. Decades later, Mariner developed a vaccine^{1,5} that remained effective for a month at 30°C. Modern serological⁸ and molecular tools have helped in the progress of the investigation. Molecular analyses have traced the lineages of rinderpest to Asia and Africa – a discovery that has helped scientists to track the reservoir of the viruses⁹. A new rapid pen-side chromatographic strip test using ocular secretions¹⁰ was helpful in the 2000 outbreak of subacute rinderpest in three Pakistani herds in 2000.

India was internationally declared as free from rinderpest by the OIE on 27 May 2004. Rinderpest was known to occur in India for decades. In the early 1950s, about 400,000 cases of rinderpest would occur every year, with only 50% survival rate. With international aid, India had launched a National Project on Rinderpest Eradication in the 1990s. The programme was to strengthen the veterinary services and to eradicate rinderpest following the pathway prescribed by OIE and the globally recommended standards for epidemiological surveillance systems¹¹.

According to an estimate by FAO, US\$ 610 million has already been spent on animal health, including rinderpest eradication in Africa and Asia. The virus was last detected in 2001 in wild buffaloes in Kenya, supposedly the last remaining reservoir. However, the most recent surveillance reports state that the virus does not exist any longer⁵. With technical assistance by FAO's Technical Cooperation programme (IAEA) and financial assistance from the European Union, the

GREP has succeeded in driving away the virus. The present situation is a remarkable improvement over past efforts.

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Asia in the midst of rice crunch

The global food scenario has spelt doom for developing countries, with a hike in its prices. One-third of the global population is expected to be hit by this crisis that has become a painful reality. This has been confirmed by the President of World Bank, Robert Zoellick and United Nations Under Secretary General for Humanitarian Affairs, John Holmes. The obvious consequences of the food crisis are shortage of food leading to inflation. A staggering hike of 40% in food prices over the last one year has led to revolts in countries like Egypt, Uzbekistan, Ivory Coast and recently, in Cameroon. In order to control the escalating domestic prices, major rice-producing countries like India, Indonesia, Cambodia, Thailand and Vietnam, have restricted exports leading to disruption of global supply chains and fuelling inflation. Asia is experiencing one of the uglier aspects of globalization: as countries have become increasingly reliant on one another for vital products, they have also become more vulnerable to external shortages and price hikes as they ripple around the world¹.

Two successive droughts in Australia, diversion of a major portion of maize crop in the US to ethanol have led to a deficit in world production and low food stock. As a result², the world price of rice in the last six months has spiralled by 60%. To make matters worse, the World Bank³ has issued a statement that food prices will remain high throughout this year and 2009, and will not return to the levels of early 2000 at least until 2015.

According to the estimates of the US Department of Agriculture, the global annual rice production was more than 420 million metric tonnes last year¹. The increase in the cost of rice has adversely affected South Asian countries, where it forms the staple food of about three billion people, approximately half of the world's population. Rising consumption of rice due to increasing population in South Asian countries like India, Pakistan and Bangladesh, conversion of agricultural land for construction purposes, increasing pests and the expanding bio-fuel industry are gradually but steadily taking their toll on the production of rice.

To combat the rice crisis, the Philippines has charted a rice self-sufficiency programme, comprising land allocation to farmers, construction of irrigation networks, and use of hybrid seeds and organic fertilizers to maximize the yield of rice production³.

Globalization has also had an adverse effect on the agrarian sector of the country, thereby threatening the food security. The contribution of agriculture to our GDP has declined from 54.56% in 1951–52 to 27.87% in 1999–2000, resulting in a reduction of nearly 50%. Export-oriented agriculture is gradually reducing the area for food cultivation, as more and more land is being used for cash-crop production⁴.

India recently witnessed an inflation of 7% in wholesale food prices and a reported 20% hike in the consumer price of rice². The growing cost of rice is attrib-

utable to the global inflation and not to low production of rice, since this year's annual rice production stands at 94 million metric tonnes with a rise of 2 million metric tonnes over the last year¹. The open economy of the nation has offered lucrative export options for the emerging farmers. Hence, the export of rice at a higher price has spearheaded the inflation of this crop in the domestic market. As a combat strategy to curb the prices, the Government has recently banned export of non-basmati rice and adjusted price controls to discourage export of aromatic basmati rice.

The source of inflation in food prices is global in nature and the solution to this problem lies in increasing the world's food production with corresponding fall in its prices. The farmers should take a cue from the present scenario and grow more crops globally to ease the inflation in coming years².

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