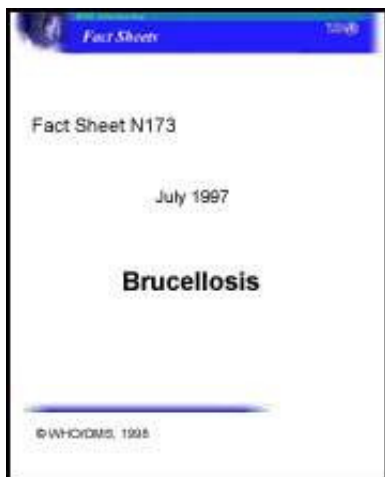



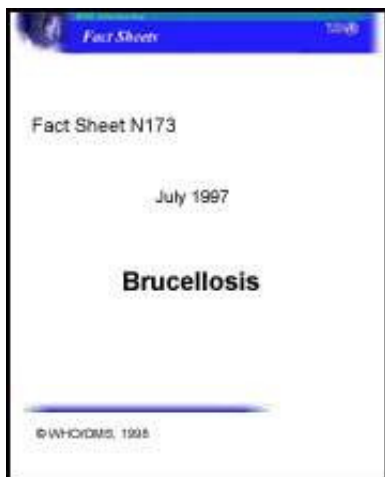


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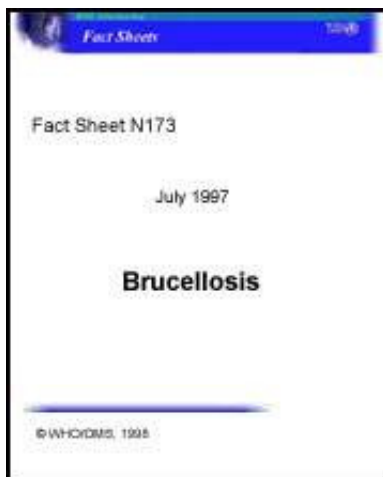
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## Brucellosis

**Animal and human health are inextricably linked. People depend on animals for nutrition, socio-economic development and companionship. Yet animals can**

**transmit many different diseases to humans. Diseases transmitted from animals to humans are termed zoonoses and some of them are potentially devastating.**

**Brucellosis is a zoonosis of both public health and economic significance in most developing countries. In many developed countries, the animal disease has been brought under control, which has led to a subsequent decrease in the number of human cases. The occurrence of the disease in humans is largely dependent on the animal reservoir. Where brucellosis exists in sheep and goats, it causes the greatest incidence of infection in humans.**

**Causes Six species of *Brucella* are currently presently known, of which *Brucella melitensis*, *Brucella suis* and *Brucella abortus* have public health implications. *Brucella melitensis* occurs more frequently than the other types in the general population and it is the most pathogenic and invasive species of *Brucella*, followed, in order, by *Brucella suis* and *Brucella abortus*.**

**Transmission Brucellosis is transmitted through contaminated and untreated milk and milk products and by direct contact with infected animals (cattle, sheep, goats, pigs, camels, buffaloes, wild ruminants and, very recently, seals), animal carcasses, and abortion materials. Worldwide, millions of individual are at risk, especially in developing countries where the infection in animals has not been brought under control, heat treatment procedures of milk (e.g. pasteurization) are not routinely applied, and food habits such as consumption of raw milk and poor hygienic conditions favour human infection. In such conditions transmission of the infection to humans may frequently occur. Although the disease in animals has been brought under control in several industrialised countries, it occurs sporadically in individuals who acquire the infection abroad or by ingestion of**

**unsafe animal products and in occupationally exposed groups (e.g. farmers, veterinarians, laboratory and slaughterhouse workers).**

**Main clinical symptoms** The incubation period of brucellosis is usually one to three weeks, but sometimes may be several months. The illness may be mild and self-limiting or severe. It may have either a sudden or insidious onset and is accompanied by continued, intermittent, or irregular fever. The symptomatology of brucellosis is like that of many other febrile diseases, but with a marked effect on the musculoskeletal system evidenced by generalized aches and pains and associated with fatigue, prostration and mental depression. Urogenital symptoms may dominate the clinical presentation in some patients. The duration of the disease can vary from a few weeks to several months and laboratory tests are needed to confirm the clinical diagnosis.

**Prevention** Brucellosis can be prevented in humans by controlling, or better, eliminating the disease in the animal population and avoiding consumption of raw milk and raw milk products. Brucellosis control programmes based on various strategies, including vaccination and/or test-and-slaughter of infected animals, have been successful in controlling the disease in animals in several countries, resulting in a drastic reduction in its incidence in the human population. Proper heat treatment of milk or milk products is important for effective prevention of brucellosis in humans. However, local customs, traditional habits and beliefs may impede the wide application of such measures. Health education should be intimately linked with all phases of prevention and control activities.

**Treatment** Antibiotics are effective against *Brucella*. However, *Brucella* is localized intracellularly like certain other micro-organisms (e.g., *Mycobacterium*

***tuberculosis*), and requires the association of more than one antimicrobial for several weeks.**

**Possible drug resistance Antimicrobial resistant strains of *Brucella* are reported; however, their clinical implications are not yet fully understood. Some of the commonly-used antimicrobials for brucellosis treatment (i.e. Rifampicin and Streptomycin) are also first line drugs for the treatment of tuberculosis. The present worldwide occurrence of multi-drug resistant strains of pathogenic *Mycobacterium tuberculosis* poses the urgent question of an alternative treatment for brucellosis, using antimicrobial agents not employed for tuberculosis.**

**Worldwide burden of the disease Although human brucellosis is a notifiable disease in many countries, official figures do not fully reflect the number of people infected each year and the true incidence has been estimated to be between 10 and 25 times higher than what reported figures indicate. Cases very often remain unrecognized because of inaccurate diagnosis, and are thus treated as other diseases or as "fever of unknown origin". Animal brucellosis also poses a barrier to trade of animals and animal products and could seriously impair socio-economic development, especially of livestock owners, a most vulnerable sector in many rural populations. As an indication of the importance of this disease, plans to eliminate ovine, caprine and bovine brucellosis from the European Union were expected to receive over half of the total European Commission funding for animal diseases control measures in 1997.**

**Brucellosis in humans and animals is increasing in certain parts of the world, especially in developing areas of the Mediterranean Region, Middle East, western Asia and parts of Africa and Latin America. *Brucella melitensis* especially, being**

**very pathogenic for human beings, constitutes a public health priority. Its recent emergence as a bovine pathogen in intensive dairy farms causes particular concern. A similar problem has also been reported where *Brucella suis* has become established in cattle.**

**In Mediterranean and Middle East countries the annual incidence of brucellosis in people varies from less than 1 up to 78 cases per 100 000; however, over 550 cases have been reported from confined endemic areas where no animal control measures are applied. Up to 77 cases per 100 000 people have been reported from certain communities of south European countries in which animal control measures are mandatory. Reported cases largely underestimate the size of the problem. From a recent survey in a randomly selected human population of a country of the Arabic Peninsula, serological evidence of exposure to *Brucella* has been found to be close to 20%, with more than 2% of these having active disease. Similar figures may be expected from most countries in which the disease is endemic in the animal population. Higher seroprevalence of brucellosis should also be expected in occupationally exposed groups.**

**WHO's efforts to combat brucellosis WHO has been involved in brucellosis work since its establishment and a number of programmes are underway to strengthen brucellosis surveillance activities at global level and to reduce the incidence of human brucellosis. In collaboration with the Food and Agriculture Organization of the United Nations, Rome, Italy (FAO) and the Office international des Epizooties, Paris, France (OIE), WHO is promoting implementation of a regional control programme in Middle East countries. The Mediterranean Zoonoses Control Programme (MZCP) of WHO is coordinating a study on the evaluation of new treatment regimes for human brucellosis. The results of the pilot feasibility study**

**were recently evaluated and the main study should begin by October 1997. WHO and the United Nations Development Programme (UNDP) are jointly assisting the Palestinian Authority to develop and implement a programme for the control of human and animal brucellosis in the West Bank and Gaza Strip. In the Americas Region, the Pan-American Health Organization and the Regional Office of WHO have launched an initiative for bovine brucellosis elimination from Latin American countries. WHO has also developed a number of educational material for the attention of travellers and consumers on dietary precautions, promoting, among others, heat treatment of milk and derived products. WHO is currently developing guidelines for integrated surveillance of brucellosis and promoting research on new brucellosis vaccines for both humans and animals.**

