GALVmed

Protecting Livestock – Improving Human Lives

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Tackling the burden of Brucellosis

One of the most common zoonotic, bacterial infections worldwide, brucellosis is of major public health and economic importance. In humans, the disease often begins as a recurrent high fever (similar to malaria) with fatigue, aching and weight loss; however it is also associated with substantial, residual chronic disease such as oster-arthritis, spondylitis and endocarditis. In livestock (cattle, sheep, goats, camels, pigs), brucellosis causes abortion, infertility in males and females, reduced milk production, and reduced numbers of calves, lambs and kids.

Brucellosis is an important constraint on the livelihoods of poor people, acting both directly on human health causing chronic disability and indirectly via decreased livestock productivity. Transmission to humans is mostly by the consumption of contaminated dairy products and contact with infected animals. Control of brucellosis in humans depends on its control in animals. In low and middle income countries (LMIC), brucellosis is endemic and neglected with large disease and livelihood burdens in animals and people and almost no effective control. Reliable estimates of prevalence in livestock in endemic countries are lacking and the few estimates available vary between 1 and 20%. In a recent study in Kenya, sero-prevalence in livestock was 1.2 to 3.4% and in humans was 2.2 to 14.1%.

Brucellosis is found worldwide. It is well controlled in most developed countries but the clinical disease is still common in the Middle East, Asia, Africa, South and Central America, the Mediterranean Basin and the Caribbean. The Brucella species vary between regions and animals.

Controlling the disease

A range of diagnostic tools and vaccines are used in developed settings and have successfully controlled brucellosis in animals and hence humans in different parts of the world. Their use however in LMIC animal health programmes are hampered by several technical, social and economic factors e.g. quality and appropriateness of different vaccines for different settings, livestock keepers perceptions towards the disease, competing demands and lack of incentives for its control, and unrecognised human burden of the disease. GALVmed, funded by Biotechnology and Biological Sciences Research Council is working to translate into tangible benefits, the research findings of a new multi-sectoral project of field studies to expand knowledge and to target control of the disease by vaccination in dairy farms supplying milk to rapidly growing urban populations in West and Central Africa. The project consortium is centred around the Interstate School of Veterinary Science and Medicine, Dakar, working with leading UK veterinary and medical institutions, the Royal Veterinary College, the London School of Hygiene and Tropical Medicine, and the Animal Plant Health Agency.

In addition, GALVmed is collaborating with United States Department of Agriculture to evaluate the potential for novel, single-dose therapeutic approaches that may be used to rapidly reduce the prevalence of brucellosis in flocks and herds, thus making vaccination and other control methods more applicable in endemic areas.

Field studies will measure the burden of brucellosis in peri-urban areas, identify routes by which people become infected, assess farmers' perceptions and attitudes toward the disease, assess vaccines for effectiveness in livestock, and explore key stakeholder and institutional relationships to identify how to effectively deliver control measures for brucellosis. The immediate beneficiaries of the project are dairy farmers and their workers and families, together with the much larger population of consumers of the milk. Training and capacity building are also a central part of the work. Importantly, both of the GALVmed projects aim to enable the implementation of a new generation of sustainable, prevalence reduction programs for brucellosis that could be applied in other resource-scarce endemic settings beyond the project target area.

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info@galvmed.org
www.galvmed.org