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Brucellosis a Chronic and Difficult Disease to Control in Africa

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- FAO (2000) speculated that human population will increase to 7.7 billion (7.7b) (26.2%) in 2020 and the demand for animal protein to 50%. Africa with its total surface area of 30 million and 319000 ^{2} km., three of the longest 12 rivers in the world, large lakes of fresh water like Lake Victoria, Tanganyika, Malawi; dams like Swan Dam, heavy rain fall zones, plenty of underground water and about 1b and 22mpopulation in 2010,could be a possible source of food for other parts of world.

- Unfortunately, major epidemics of animal diseases such as FMD, RVF, CBPP, ASF, PPR, LSD, Brucellosis (BR.) etc. occur endemically in the continent. Among them BR has a notable importance: it's a transboundry animal disease, a zoonosis, infects multiple animal species, causes reproductive failure, loss of milk production and is a barrier to trade. The disease is a chronic problem in Africa. Forty years ago, Thimm and Wundt (1978)reported the disease in 40 (82%) of the 49 countries of continent then (now 54) affecting 26 (68,4 %) species of wildlife, and that

- 88% of herds and 42.2 % - 100% of the villagers cattle were infected. Chukwu (1987) reported that at least six of *Brucella abortus (B. abortus)* species biovars, the three of *B. melitensis , B. ovis and B. canis* were isolated from animals in the continent. Musa (1995) reported the prevalence of the disease to be 13.9 in cattle, 7.8% in camels, 6% in goats, 3.6% in sheep and 12.7 % in nomadic people of a particular tribe, in Darfur, Western Sudan.

- Studies have also shown that the prevalence of bovine brucellosis ranged between 3.3%in Central African Republic, 41% in Togo and percentages between the two in Chad, Sudan, Eritrea, Tanzania, Burkina Faso, Ghana, Mali, Nigeria and Zimbabwe (McDermott and Arimi, 2002). In Gambia, the prevalence of the disease in small ruminants from 54 villages ranged between 0.1% and 7% and was 17% in 60 patients in hospitals (Unger *et al*., 2005)

- More recently, Miller *et al*. (2015) found the prevalence of the disease to be 14% in 768 cattle, 17 % in 315 goats and 11% in 236 humans in Uganda.
- The findings prove that BR Is endemic in Africa, infects both man and animal and was not sufficiently controlled throughout the continent.
- There are many factors associated with the wide spread of the disease in Africa, beside lack of control and are as follows:

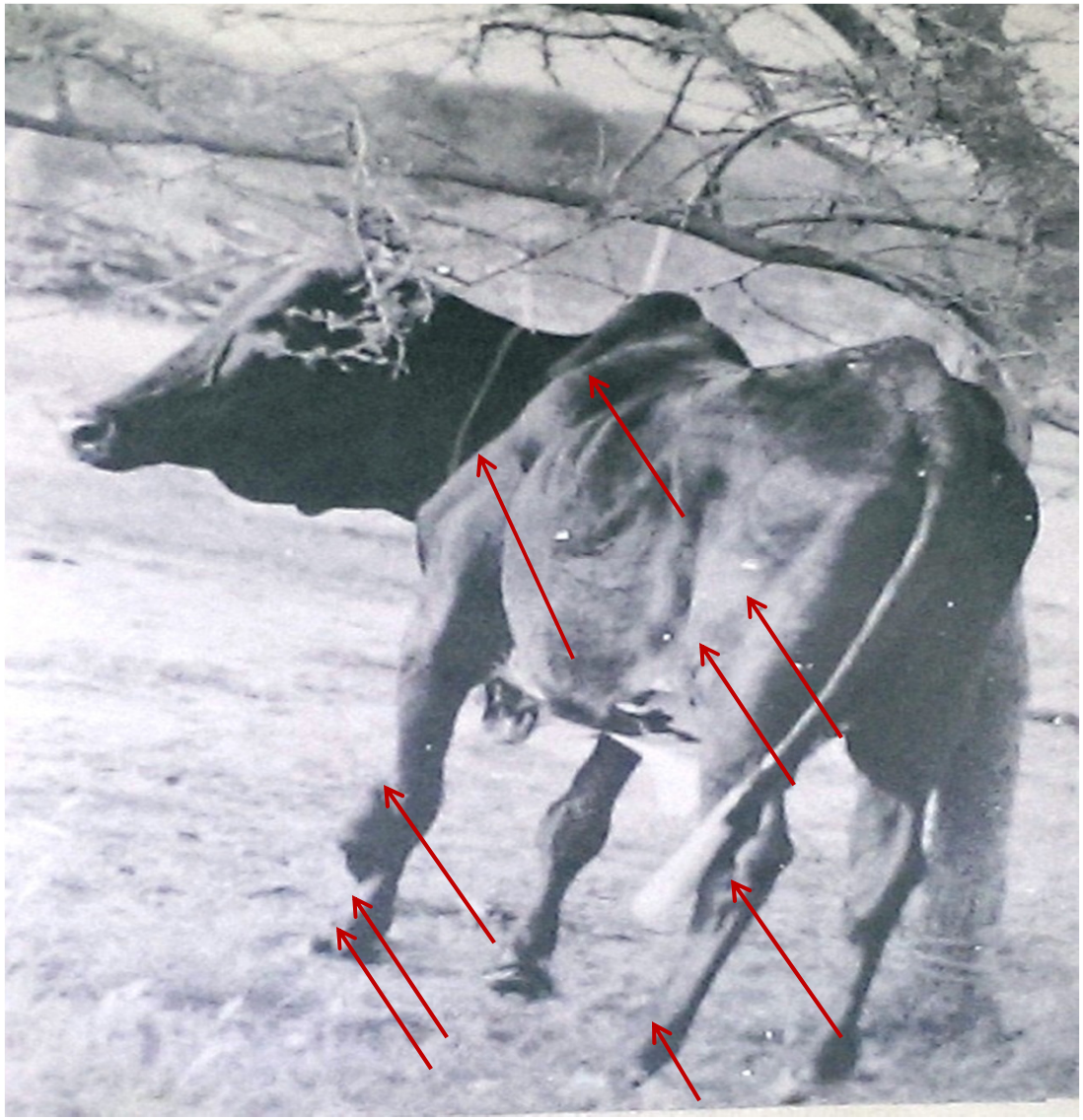
Unawareness of animal owners:

- Animal owners are unaware of impacts of the disease and do not care about aborting non killing diseases. They do not dispose aborted foetuses and their membranes nor isolate aborting ones from the rest of the herds, resulting in further dissemination of the disease. Hygromas due to brucellosis are commonly seen in African cattle (Fig,1) . Musa *et al. (*1990 b) reported that 14 (39%) of 36 nomadic cattle herds examined had animals with Hygromas due to brucellosis. The prevalence of the disease in such cattle was found between 2.6 -32% (Musa,1995). A herd of 200 cattle had a cow(Fig.2) with multiple Hygromas and a bull with a knee hygroma. Upon examination, 95 (47.5) of the cattle and three of owners were positive for the disease.

Fig.1 a cow with a hygroma kept in a fence with others



Fig.2 a cow with multiple hygromas (on 17 sites)



- **Cross border movements**:
- Movements of animals between countries in the continent result in dissemination of brucellosis. Baumann (1983)studied the disease in Broro cattle in Southern Sudan and found 99% of the herds and 22.5% of their individual cattle positive for the disease. Broro attle migrate from one country to another in SSA (Fig.3). *B.abortus* biovar 6 was isolated from cattle along major migratory routes from West to East Africa as a result of such movements (Musa,1990a).

- **Intensive multispecies transhumance:**
- Animal owners in Africa, farm cattle, sheep and goats; camels, sheep and goats or sheep and goats together with a fewer other animals(camels, horses, donkeys and dogs) and depend on continuous movements under transhumance system of animal husbandry (Fig. 4). This heavy turn over of multiple animal species results in dissemination of brucellosis and cross infection of animals with different *Brucella* species. Thus different *Brucella* species were isolated from all domesticated animals (Chukwu, 1987) and *B. abortus* was isolated from cattle, camels, sheep, goats and humans; and *B. melitensis* from sheep, goats, cattle and camels in the Sudan and the prevalence of brucellosis was the highest compared with other husbandry practices (Musa *et al.* 2008; Ibrahim,2011).

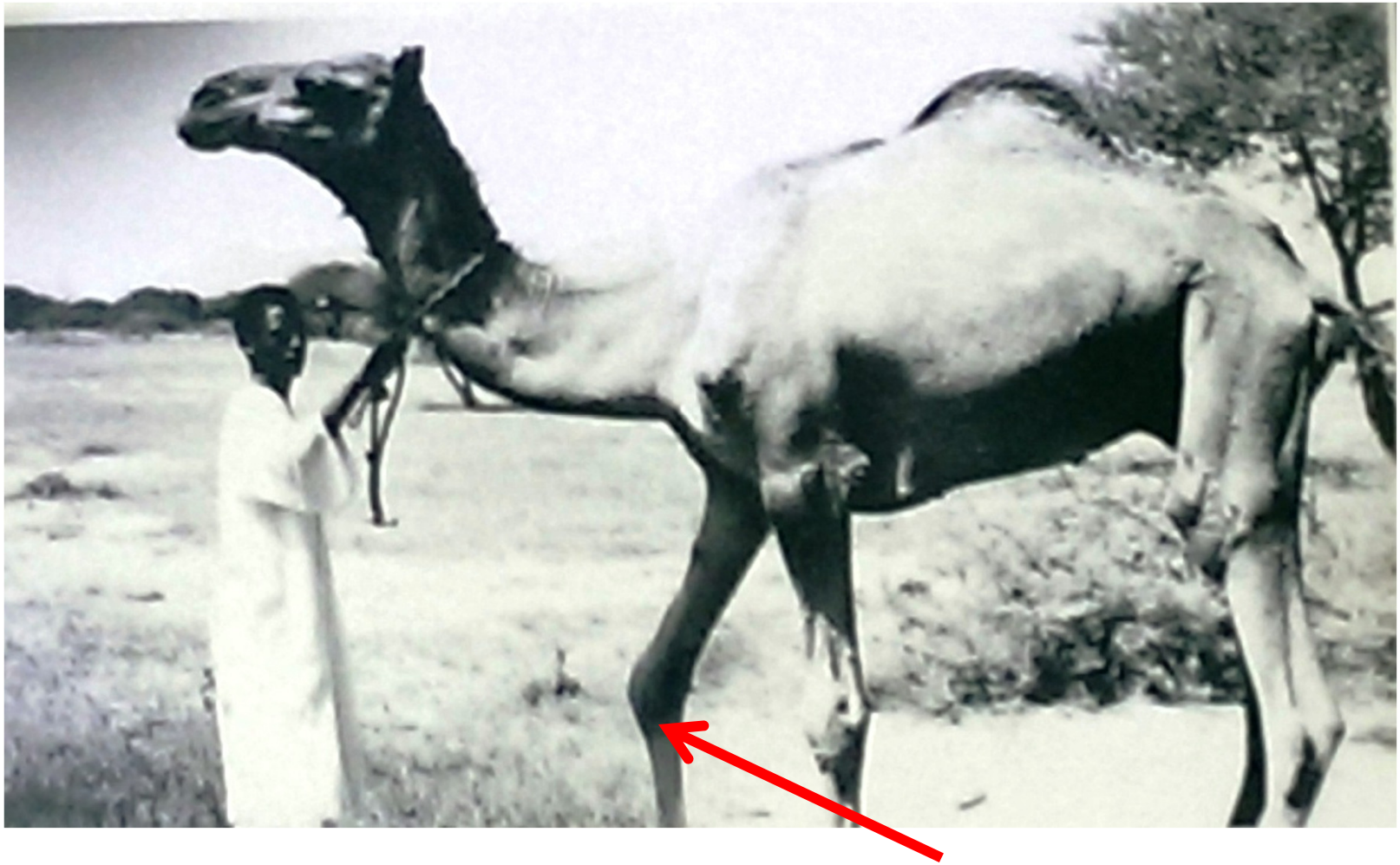
Fig.3 Broro cattle move between SSN countries and Fig. 4 transhumance in Sudan





- **Changes of husbandry practices:**
- Camels were raised previously in semi arid and arid lands in the Sudan. But they were shifted to transhumance areas and share other species the natural resources. The change exposed camels to brucellosis and they emerged as the most susceptible species to the disease and prevalence ranging from 6% to 19.9% were reported in two localities (Musa *et al*., 2008), compared with the 3.1 to 7.5% reported earlier by Abu Damir *et al.* (1984). Hygromas the chronic manifestations of the disease were also observed in camels (Fig.5)

Fig.5 a camel with a knee hygroma due to brucellosis



- **Ecological and environmental conditions:**
- Animals infected with brucellosis, shed *Brucella* organisms after abortion and normal deliveries for periods ranging from two weeks to three months, depending on the species contaminate pastures, water resources and the environment (Figs 6and7) like aborted foetuses and foetal membranes, and become potential sources of infection with brucellosis under the current animal husbandry practices in Africa. Besides, insects especially flies that feed on the sources of *Brucella* organisms ,and

Factors of human infection:

- People are infected directly by tending infected animals, interfering with dystocias, milking and consuming raw milk and meat and coming in direct or indirect contact with infected material(Fig.8and9)

Fig.6 and 7: contamination of water and environment





Figs.8 : Possible means of human infection by milking infected cattle and Fig9 by sharing housing with animals which could be infected





- **Impacts of brucellosis in Africa**
- ***Effects of the disease:***
- The disease causes the following clinical manifestations in infected cattle, in declining order: abortion, development of Hygromas, retention of placenta, arthritis, debility, and long calving interval (Musa, 1995).

- ***Economical impacts:***
- Musa *et al.* (2008) stated that the main economical impacts of brucellosis in a diary complex in Sudan, are prevalence of 24.9% in individual animals, 226 loss of calves and, loss of 392.5 tons of milk. The total loss of milk production and infertility estimated at 267642 US dollars.

- ***The disease in man*:**
- Human infections are the most important of the impacts since many people in different sectors such as veterinarians and other occupationals, abattoir and meat process workers and consumers of animal products are infected and because of loss of man power due to the disease and costs of their hospitalisation and treatments.

• Conclusion and recommendations

- Incidences of brucellosis increase because of lack of control measures. The disease affects livelihoods, Economy, Public health and food Security in Africa. Its important to raise awareness of animal owners about the impacts of BR in the continent to assist in efforts of control and eradication, and governments to allocate enough resources for their campaigns.
- Africans can not control the disease and the other epidemics because of technical and economical problems. Rinderpest was controlled and eradicated successfully by joint ventures. Its urged that AU-IBAR, FAO, EU, WHO,OIE and other partners join efforts to eradicate the major epidemics especially FMD, BR .CBPP so that Africa could fill gaps of food supplies by 2020.