Diagnostic tool could help in the clinical diagnosis of cattle diseases in sub-Saharan Africa

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Diagnosis is key to the control and prevention of endemic livestock diseases in developing regions. New research has found the use of a low-cost diagnostic decision support tool could lead to the improvement in clinical practice by veterinary and animal health officers in sub-Saharan Africa.

An international team, led by Professor Mark Eisler, Chair in Global Farm Animal Health in the School of Veterinary Sciences at the University of Bristol, evaluated the effectiveness of a low-cost decision support tool as a diagnostic aid by observing whether its introduction to veterinary and animal health officers undertaking primary animal health care in Uganda could lead to changes in clinical practice. Their research is published today in PloS ONE.

Improved diagnosis is necessary for the effective management of endemic cattle diseases in sub-Saharan Africa. However, this is currently constrained by the limited availability of suitably trained professional staff and field-level diagnostic tests, and a general lack of knowledge about disease among livestock owners.

A number of parasites of cattle occur in the study area, including intestinal nematode worms, an animal form of sleeping sickness transmitted by the tsetse fly, a number of the tick-borne blood parasites, and liver and blood flukes that are transmitted by intermediate host

snails living in swamps and marshland. The severe illnesses these parasites cause are difficult to distinguish, which is a problem for the African farmers dependant upon cattle for their livelihoods, as a different treatment is required for each.

Fifteen clinical participants undertaking primary animal health care in five districts of Uganda were recruited to take part in the study, including District Veterinary Officers, Veterinary Officers and Animal Health Officers.

They recorded their diagnoses for over 1,400 bovine clinical cases seen before and after the introduction of the low-cost diagnostic decision support tool implemented as a simple printed card that related each of eight key diseases to a number of clinical signs.

Professor Eisler said: "Reassuringly the diagnostic decision support tool covered the majority of diagnoses made before or after its introduction. Our most important finding was a significant increase in the number of clinical signs recorded, suggesting improvement in clinical examination as a key beneficial consequence of its use.

"It may also advise of a specific disease in a geographical area and be a useful epidemiological tool in poorly resourced areas."

Prior to the introduction of the tool the conditions most commonly diagnosed among 713 bovine clinical cases were trypanosomosis, theileriosis, anaplasmosis, and parasitic gastroenteritis (PGE).

Subsequently, in the next 747 bovine clinical cases examined the estimated proportional morbidity of fasciolosis doubled, while theileriosis and PGE were diagnosed significantly less frequently.

The average number of clinical signs increased from 3.5 to 4.9 per case,

with 28 per cent of cases reporting six or more signs compared to just three per cent beforehand. Anaemia/pallor, weakness and a staring coat contributed most to this increase, approximately doubling in number and were recorded in over half of all cases, suggesting these key diagnostic indicators were under-observed prior to use of the tool.

The increase in the number of clinical signs recorded by participants showed the benefits of the diagnostic decision support tool and how its use in cattle can be seen in the same way as that of diagnostic "checklists" in human hospitals, improving efficiency and reducing missed clinical signs or mistaken diagnoses.

More information: 'Diagnosis of Cattle Diseases Endemic to Sub-Saharan Africa: Evaluating a Low Cost Decision Support Tool in Use by Veterinary Personnel', Mark C. Eisler, Joseph W. Magona and Crawford W. Revie, *PLoS ONE*.

Provided by University of Bristol

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