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Sero prevalence of bovine brucellosis in Andhra Pradesh for the past five years

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Abstract
Brucellosis is an economically important infection of livestock due to the reproductive problems it causes and also the risk to the public health. A study of bovine brucellosis was conducted using Indirect Enzyme linked immunosorbent Assay (i-ELISA), a serological test to determine the disease status in Andhra Pradesh state for the past five years. A total of 8849 sera samples from Bovines were screened during past five years (2017-18 to 2021-22. The percentage of positivity is 8.13%, 13.32%, 27.41%, 25.37% and 9.58% respectively starting from 2017-18 to 2021.22. The present study reveals that initially there is increase in the percent positivity later there is a descending pattern due to phased Brucella vaccinations of Bovine population and culling or separation of positive reactors for Brucella.

Keywords: Bovine Brucellosis, iELISA, percentage positivity, serological test

Introduction
Brucellosis is a complex bacterial zoonotic disease caused by facultative, intracellular bacteria of genus *Brucella* that survive and reproduce within host phagocytic cells with significant economic and global health hazard, particularly for human and animal populations within developing countries which depend on cooperative farming and agricultural activities. (Gloria J. Kang, *et al*. 2014) [1]. The Genus Brucella mainly infect cattle, Buffalo, swine, goats, sheep and Humans. Humans generally acquire the disease through direct contact with infected animals, by eating or drinking contaminated animal products or by inhaling airborne agents. Regular and meticulous surveillance is essentially required to determine the true picture of brucellosis especially in areas with continuous high prevalence (Bovine Brucellosis – A comprehensive review by Sandip kumar khurana *et al*., 2021) [2]. The pathogenicity of *Brucella* spp. involves an efficient adaptation that prevents recognition by the immune system and manipulates fundamental properties of host cell physiology.
Prevention of brucellosis is based on surveillance and the prevention of risk factors. The most effective prevention strategy is the elimination of infection in animals. Vaccination of cattle, goats and sheep is recommended in enzootic areas with high prevalence rates. Serological testing and culling of positive animals can also be effective in areas with low prevalence.

Materials and Methods
A total of 8849 Bovine sera samples received from 13 different districts of Andhra Pradesh (2017-18- 1932; 2018-19---2612; 2019-20---956; 2020-21---938 and 2021-22---2411) were tested during the past five years from 2017-18 to 2021-22) using Serum Indirect ELISA for Brucellosis of Genomix and IDVET Kits (V R Vanzini, N Aguirre, CI Lugaresi, ST de Echaide, VG de Canavesio, A A Guglielmone, M D Marchesino, K Nielsen) [1].

Results and Discussions
During the year 2017-18 out of 1932 bovine sera samples tested 157 sera samples found positive for Brucella Antibodies. In 2018-19, a total of 2612 bovine sera samples were tested for Brucella antibodies which yields 13.32% positivity (348 sera tested positive). During the year 2019-20 and 2020-21 out of 956 and 938 bovine sera samples tested 262 and 238 sera samples respectively found positive for Brucella antibodies which ultimately account for 27.41% and 25.37%.

In the year 2021-22, 2411 bovine sera samples tested 231 sera samples were reactive for Brucella antidodies i.e. 9.58%. These results are in correlation with the Neha *et al*. (2017) [3] who stated that I-ELISA can be routinely used for an accurate and efficient diagnosis of *Brucella* infection, because the chances of non-detection of an infected animal in I-ELISA are minimal. These results are in agreement with results of Statin zadon *et al*. (2015) [6] who reveals that prevalence of Brucellosis among cattle in Punjab was 23.01%.

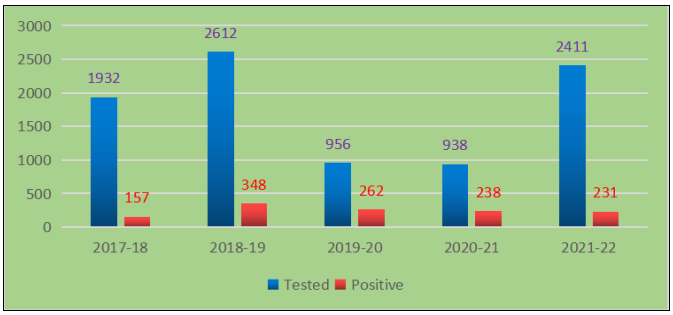

Fig 1: Sero prevalence of bovine brucellosis during past five years

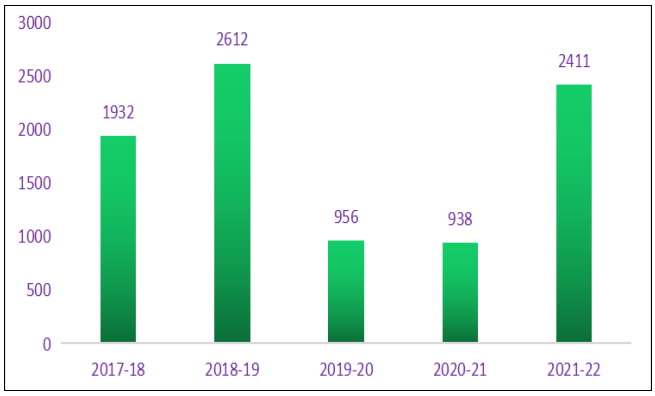

Fig 2: Graphical representation of number of bovine sera tested during the past five years for brucellosis

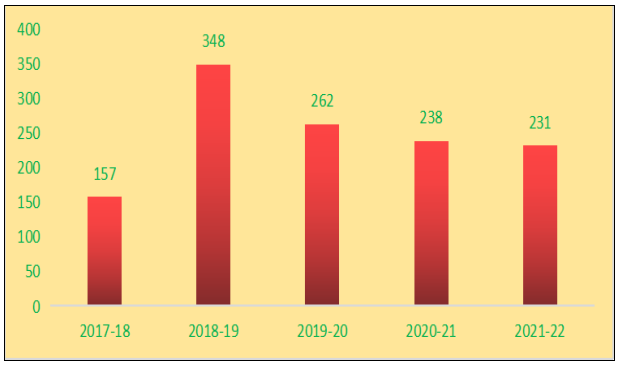

Fig 3: Graphical representation of number of positive bovine sera detected during the past five years for brucellosis

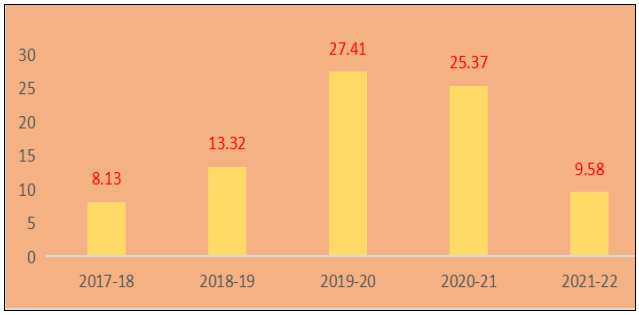

Fig 4: Graphical representation of precent positivity of bovine sera detected during the past five years for brucellosis

It was observed that there is gradual increase in the percent positivity from 2017-18 to 2018-19. After that there is sudden increase in the positivity was observed which may be due to the decrease in the number of samples tested during those two years. After that during 2021-22 again sudden decrease in the percent positivity was noticed which might be due to sudden increase in the tested samples. Otherwise it may be due to the Brucella vaccination of Bovine population in a phased manner or might be due to the culling and separation of Brucella positive animals as suggested in our results. These observaions were in agreement with the Ramesh V. Jagapur *et al*. (2013) [5] who did sero prevalence studies in India in Cattle using Indirect ELISA and suggests that regular screening and removal of reactive animals with highly specific screening test like I ELISA.

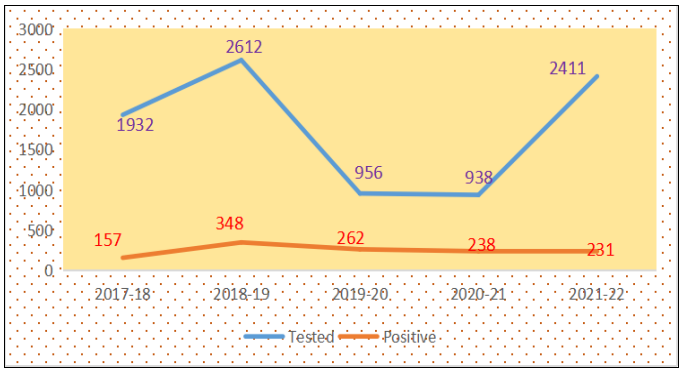

Fig 5: Line chart of showing sero prevalence of bovine brucellosis for the past five years

Summary

This study revealed sero prevalence of Bovine Brucellosis for the past five years in Andhra Pradesh based on the sero diagnosis of Bovine sera samples received from different districts of Andhra Pradesh done at Veterinary Biological & Research Institute, Vijayawada since five years. It reveals that initially there is increase in the percent positivity later there is a descending pattern in the percent positivity due to phased Brucella vaccinations of Bovine population and culling or separation of positive reactors for Brucella. However there is a need for create awareness among farmers which play a vital role in controlling the Brucellosis.

Acknowledgement

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