COMPARISON OF SEED GERMINATION TEST WITH URINE BARIUM CHLORIDE TEST AND MILK COPPER SULPHATE TEST FOR EFFICACY TO DETECT PREGNANCY IN COWS

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ABSTRACT
The present study included per rectally confirmed pregnant (n=30) and non pregnant cows (n=30), all milking, selected to conduct urine barium chloride test, milk copper sulphate test and seed germination test for pregnancy. The data were assessed for significance using Cochran Q test. The results indicated that the efficacies of true positive reaction for pregnancy and non pregnancy status in cows were 100 per cent, each by seed germination test whereas 80 and 10 per cent respectively, by urine barium chloride test, and 90 and 13.33 per cent by milk copper sulphate test.

Key words: Seed germination test, Urine barium chloride test, Milk copper sulphate test, Pregnancy.

Even though there are a large number of pregnancy detection methods available for use in cows their efficacies are highly variable. These techniques broadly comprise physical, chemical, biochemical, immunological and biological methods (Wani et al., 2003). But the search for a simple, dependable, user friendly, economical and door step technique for early pregnancy detection in cows continues. In this respect, a study was taken up to establish the comparative efficacies of urine barium chloride test, milk copper sulphate test and seed germination test to detect pregnancy in cows.

The detection of pregnancy in cows using barium chloride test was performed as per the method explained by Maslov and Smirnov (1965). Here, to a known volume of freshly collected neat urine an equal volume of one per cent solution of barium chloride was added. While formation of a white precipitate indicated the status of non pregnancy, a clear solution indicated that of pregnancy. The method of pregnancy detection in cows using copper sulphate was performed as explained by Stancev and Angelov (1966). Here, about 0.5 to 1.0ml of milk was mixed with 10ml of three per cent copper sulphate solution. The milk collected from a pregnant cow coagulated while that collected from a non pregnant cow formed a homogeneous mixture that remained for several hours. The seed germination test was performed using wheat seeds as explained by Veena and Narendranath (1993). It consisted of subjecting wheat seeds to germination in sterile petridishes with fresh urine sample diluted with water in the ratio 1:4. A significant inhibitory germination response (33.6 ± 1.10 %) in this treatment as compared to that treated with water (84.66 ± 1.43 %) and diluted fresh urine sample of confirmed non pregnant cows (61.38 ± 2.90 %) as controls, and concomitant discoloration of germinating fluid/seeds observed after 48 hours, are together taken as positive result for true pregnancy.

In the present study per rectally confirmed pregnant (n=30) and non pregnant cows (n=30), all milking were selected to conduct all the three tests. The data was assessed for significance using Cochran Q test (Snedecor and Cochran, 1967). The results were recorded as in the Table 1, The percentages of true positive reaction for pregnancy and non pregnancy status in cows were 100 each by seed germination test which is in agreement with the reports of Avahikar (2002). The percentages of true positive reaction for pregnancy

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and non pregnancy status in cows by urine barium chloride test were 80 and 10. Though the efficacy for true positive reaction for pregnancy is comparable with the reports of Kaveni et al., (1983), Vohra and Kaikini (1992), it is higher than those reported by Verma and Mishra (1981) and lower than those reported by Moslov and Smirnov (1965) and Temblador and Landa (1971). The efficacy of this test for detecting non pregnancy is less than those reported by Elpakov and Cyganok (1966), Akhmadeev and Vasilev (1967), Temblador and Landa (1971), Kavani et al. (1983), and Vhora and Kaikini (1992). While false negative reaction for pregnancy was only 20 per cent, false negative for non pregnancy was 90.

The percentage of true positive reaction for pregnancy status by milk copper sulphate test was 90 per cent, which is comparable to those reported by Stancev and Angelov (1966), Temblador and Acosta (1971) and Vhora and Kaikini (1992), but higher than those reported by Abilay and Roussel (1975) and Kavani et al., (1983). The percentage of efficacy for non pregnancy by this test was only 13.33 with 86.67 per cent false negative results.

Therefore, the seed germination test is more useful in detecting pregnancy as it has no negative reactions for true pregnancy as well as true non pregnancy. But, the other two tests are limited by their high percentage of false negative reactions both in pregnant and non pregnant cows.

Variation in efficacies reported by different authors with respect to milk copper test and urine barium chloride test might have resulted due to differences in the levels of estrogen and progesterone excreted in milk and urine during different stages of pregnancy. But the active factor responsible for reactions in seed germination test needs to be unraveled.

**CONCLUSION**

Comparison of seed germination test for efficacy, with urine barium chloride test and milk copper sulphate test for pregnancy in cows indicated that seed germination test was 100 per cent reliable in detecting the status of pregnancy as well as non pregnancy with no negative results. The other tests noted a very high degree of negative results, especially for non pregnancy. Even though the seed germination test is highly reliable the duration of the test itself is a constraint in appraising the rural community for adoption to pregnancy detection. So, further investigation not only aimed at isolation and identification of the active inhibitory principle excreted in urine of pregnant cows but also at improving the procedures to reduce the duration of the test to yield quick results is highly recommended.

**REFERENCES**

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