

Evaluation of Two Chute-Side Tests for the Detection of Leukocytes and Bacteria in Semen from Yearling Bulls

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Introduction

The presence of leukocytes in semen causes bulls to potentially be unsatisfactory breeders. Multistix[®] 10 SG Reagent Strips (Bayer HealthCare, Elkhart, IN) and the Uriscreeen[™] catalase test (Jant Pharmacal Corporation, Encino, CA) were used to evaluate their possibility to serve as chute-side tests to detect leukospermia and bacteriospermia in yearling bulls. The reagent strips detect esterases produced by granulocytes, whereas the catalase test reportedly detects the presence of somatic cells (> 10 cells per high power field) or bacteria (>5 x 10⁴ CFU/ml).

Materials and Methods

Semen samples were obtained by electroejaculation from 155 yearling beef bulls at the Indiana Beef Evaluation Program. Semen smears were air-dried, stained with Modified Wright's Stain, and evaluated for the presence of leukocytes and bacteria (both scored using an ordinal system of 0=none, 1=few, 2=moderate, 3=numerous). The remaining semen sample was evaluated for volume, spermatozoal concentration, progressive spermatozoal motility, and pH, as well as the presence of catalase activity and leukocytes (reagent strips). The correlation between leukocytes and bacteria in the semen smear and other study variables was determined using Spearman's rho (r_s).

Results

The number of leukocytes in semen were significantly ($P<0.05$) and positively associated with reagent

strip leukocyte reaction ($r_s = 0.42, P<0.0001$) and bacteria score ($r_s = 0.18, P=0.029$), and negatively associated with age ($r_s = -0.30, P=0.0002$) and volume of ejaculate ($r_s = -0.16, P=0.042$). A reagent strip test result of trace or greater had a sensitivity (Se) of 0.32 (37/114) and specificity (Sp) of 0.32 (37/40), respectively, for detecting the presence of leukocytes in the semen sample. A reagent strip test result of small or greater had a Se of 0.14 (16/114) and a Sp of 1.00 (40/40) for detecting the presence of leukocytes in the semen sample. The number of bacteria in semen was not associated with any study variable except the number of leukocytes in semen. Ninety-one percent of semen samples were catalase positive.

Significance

Our results indicate that leukospermia is associated with bacteriospermia and that both are more common in younger bulls. We also conclude that Multistix[®] 10 SG Reagent Strips may have some clinical utility as an inexpensive chute-side test for confirming the presence of leukocytes in bull semen; however, the low Se of the test may limit its clinical value. The Uriscreeen[™] catalase test does not appear to have clinical utility as a test for the presence of leukocytes in bull semen, presumably because the majority of semen samples have intrinsic catalase activity.