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Quality Deer Serum Without a Centrifuge

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There is seldom a centrifuge available to extract serum from bloods drawn from wildlife during field operations. However, by letting whole blood clot, retract and settle overnight the supernatant serum can be decanted. Tasker (1978, Cornell Vet. 68: 480–505) found that storing clotted bovine whole blood for 3 days at room temperature did not cause significant changes in test values for total protein, albumin, urea nitrogen, creatinine, bilirubin, lactic dehydrogenase (LDH), creatine phosphokinase (CPK), sodium, chloride, calcium, alkaline phosphatase (ALP), or cholesterol, but did cause significant changes in glutamic oxalacetic transaminase (GOT), potassium and glucose. Laessig et al. (1976, Am. J. Clin. Pathol. 66: 598–604) found that prolonged contact of human serum with the clot caused significant changes in test results of glucose, LDH, and potassium. This report demonstrates potential changes in the quality of serum of white-tailed deer (*Odocoileus virginianus*) when it is recovered without centrifugation.

Seven blood samples were taken from five white-tailed deer (two of the deer were bled twice) immobilized with a Rompun (xylazine)-Sernylan(phencyclidine-HCl)-Sparine(promazine-HCl) or a Sernylan-Sparine combination (Seal, 1969, Fed. Proc. 28: 1410–1419). Samples were drawn from the jugular vein using Becton-Dickinson Vacutainer® holders with 20-ga needles and #6432 silicone coated collection tubes. Each blood sample was paired by drawing into two separate collection tubes. One sample of each pair was handled in the traditional way by centrifuging, pouring the serum into 16 × 100 mm disposable culture tubes, recentrifuging and pouring into 13 × 100 mm polystyrene screw-cap vials within 6 hr of being drawn. The remaining sample of each pair was allowed to clot, retract and settle overnight at room temperature. After 16–24 hr, the serum was poured off the clot into 13 × 100 mm polystyrene screw-cap vials avoiding transfer of red cells.

All samples were analyzed quantitatively for glucose, urea nitrogen, creatinine, total protein, albumin, globulins, sodium, potassium, calcium, magnesium, total lipid, cholesterol, GOT, glutamic pyruvic transaminase (GPT), LDH, CPK and ALP using methods as described by Fuller et al. (1985, J. Wildl. Dis. 21: 29–32), and copper, iron and zinc using a method modified from Watkins et al. (1971, Microchem. J. 16: 14–23).

The results from the centrifuged samples were compared with those from the non-centrifuged samples using paired t-tests ($\alpha = 0.01$). Only LDH and glucose of the tested parameters showed significant differences between the centrifuged and non-centrifuged sera. LDH concentrations averaged 22.3% higher in the noncentrifuged sample, while glucose concentrations were 6.0% lower. The loss of glucose can be prevented by placing a portion of the original whole blood sample in fluoride (Major, 1923, J. Am. Med. Assoc. 81: 1952) for the glucose assay. Three additional assays, GOT, CPK and sodium,

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showed potential differences ($0.05 < P < 0.01$), but the percent changes were less than the coefficients of variation for each test making the differences negligible. A large change in zinc was observed in two of the seven sample pairs, and probably represents contamination, possibly from the vacutainer stopper (Nackowski et al., 1977, Am. Ind. Hyg. Assoc. J. 38: 503–508).

In light of these results, it appears that clotting overnight and decanting is a viable alternative to centrifugation for recovering white-tailed deer serum provided LDH is not a necessary parameter. It should be noted that in our experience this technique recovers less serum per unit volume of whole blood than is recovered by centrifugation.

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—Donald J. Forrester, Editor