at the cranial pole of the testis. The testis was exteriorized and the spermatic cord exposed.

Eight cm proximal to the pampiniform plexus the spermatic artery, vein and ductus deferens were doubly ligated with No. 0 chromic gut and then transected between the ligatures. The tunica vaginalis parietalis was transected and the external cremaster muscle was ligated and transected just distal to the stump of the spermatic cord. The tunica vaginalis parietalis was closed with a Connell pattern using No. 0 chromic gut.

The tunica dartos was closed with No. 0 chromic gut in a simple continuous pattern. Skin closure was with a continuous interlocking pattern of 0.4 mm synthetic suture[e]

Results

Semen parameters were within satisfactory limits for all bulls before surgery. The percentage of normal sperm declined on postoperative day 6 ($p<0.05$) and there was no significant difference ($p>0.05$) in the percentage of total abornormalities on the remaining sampling days. Progressive motility scores varied throughout the study and on postoperative days 6, 8, 29, 42 and 58 there was a significant ($p<0.05$) decrease in progressive motility. When all scores were compared for the duration of the study there was no significant difference ($P>0.05$) in semen progressive motility.

Comparing the semen parameters of those bulls having winter (n=4) as opposed to spring (n=5) surgery, no differences were found ($p>0.05$). Neither were any differences found to exist among bulls having right (n=4) or left (n=5) testical removal.

Preoperative thermograms were normal and demonstrated a constant and symmetrical thermal pattern with the apex of the scrotum being 4 to 6 C cooler than the base. On postoperative day 3 the intact scrotal side maintained a normal thermal pattern and the side of the scrotum subjected to surgery showed disruption of the symmetrical thermal pattern and loss of the temperature gradient from base to apex. By postoperative day 7 a normal scrotal temperature pattern was returning for all bulls although the thermal patterns over the incision sites were irregular the temperature gradients was between 3 and 4 C. On postoperative day 14 most of the bulls had normal thermal patterns and temperature gradients and by day 21 all bulls had regained a normal temperature pattern and gradient.

Discussion

Unilateral orchiectomy had no detrimental effect on semen quality of the remaining testicle of normal bulls by the third week following surgery. The decreased progressive motility scores and percentage of normal sperm were transient and had little influence on breeding soundness. The scrotal thermal pattern showed early postsurgical inflammation but in some cases returned to normal as early as 10 days and all were normal by day 21.

Bulls subjected to this procedure for correction of pathological conditions can be expected to sustain minimal additional inflammation to the remaining testicle. It is proposed that the use of proper surgical technique, asepsis, brevity of surgical time and convalescence in clean quarters are important factors to minimize the insult to the remaining testicle.

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[e] *Vetafil, S. Jackson, Inc., Washington, DC.*

Effect of Feeding Microbial Cultures to Milk Fed Dairy Calves

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Two trials using two different commercially available microbial culture products containing *Lactobacillus acidophilus* and other related organisms, were conducted to determine their effect on grain intake, weight gain, and diarrheal disease morbidity and mortality in milk fed dairy calves.

175 Holstein bulls and heifers were randomly assigned at birth to groups of equal size. The groups consisted of treatment calves that received a microbial culture product and control calves that received a placebo or no treatment. The calves were weighed at assignment and at trials terminating 28 days later. Grain intake was determined daily. Evaluation and treatment of diarrhea and respiratory disease were reported and recorded daily. The response variables were recorded as geometric means and were analyzed for significance by analysis of variance using SAS-GLM.

There were no significant differences at the 0.05 level between the treatment or control groups for any of the parameters examined in either trial. The results favored the treatment groups in total feed intake and weight gain, though these trends are not significantly different at the 0.05 level. When feed intake was examined by repeated measure analysis, it showed a marginal significance at the 0.1 level favoring the treatment group.

These calves were fed whole milk throughout this study, which may have reduced the anticipated benefit of feeding microbial culture and fermentation products. Perhaps under less optimal management systems, the positive trends observed in these trials would be enhanced.

Comparisons of Colostral and Serum Antibody Titres in Cows Vaccinated with *E. coli* K99 Antigens

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A field trial was conducted on a large dairy farm to evaluate the serum and colostral antibody responses to four commercially available enterotoxigenic *E. coli* (ETEC) diarrhea vaccines. Multiparous cows (n=192) and 114 first calf heifers were randomly assigned to six treatment groups (Table 1). Groups A-D were vaccinated twice subcutaneously; the first dose 50-90 days prior to the expected calving date (at drying off); the second dose three weeks prior to calving. Group E was vaccinated only once at three weeks prior to calving and Group F served as the non-vaccinated controls.

All groups were bled via evacuated blood collection tubes at assignment to the trial, and the serum was separated, labeled and stored at -4° C. At calving, 30cc of colostrum and a second blood sample were collected, the serum was separated, and both were labeled and frozen. At the end of the trial, all samples were shipped to the testing laboratory[c] to be analyzed. Samples were coded so that treatment group identity could not be determined by the testing laboratory.

E. coli antibody titres were determined by microtitre plate agglutination. The antigen was a whole cell preparation of strains B41 (0101:K28:K99) and 3509 (09:K$^-$:K99).

The former strain is the standard used by most researchers and the strain 3509 was used in this trial because the K99 antigen was the only antigen common to the four vaccine antigens, except for the 09 fraction of the Group B vaccine. (Table 2)

[c] *Beecham Laboratories, Bristol, Tennessee 37620*

Results

Serum 1 antibody titres were less than 5 in all treatment groups. Table 3 gives the serum 2 and colostral antibody titres using the B41 antigen. Groups B and C showed the greatest serological response and were followed by the other three vaccinated groups. The control animals' antibody level remained the same as the pre-vaccination levels.

The colostral titres followed the serum titres with the exception of Group B which did not respond as favourably in the colostrum as it did in the serum. Again, the control group shows virtually no antibodies to the B41 antigens. The titre generated by Treatment C was significantly greater than all other groups.

TABLE 1. Treatment Groups[1]

A.	Coli-Bovis 2x (Beecham)—2 ml
B.	Colligen (Ft. Dodge)—5 ml
C.	Vicogen (Pitman-Moore)—5 ml
D.	Scour Guard 3 (Norden)[2]—2 ml
E.	Coli-Bovis 1x (Beecham)—2 ml
F.	Controls

[1] Approximately 50 animals per group.
[2] Viral component of this vaccine was not administered.