

Preliminary Field Testing of an Antidiarrheal for Calves

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No "one shot" prevention or cure for diarrhea (scours) in calves has yet been developed or is likely to be developed in the near future. Various methods have been used with some degree of success in reducing death losses from this complex disease. Prevention and therapy measures have included various vaccines, antiserums, sulfa drugs, antibiotics, electrolytes (both oral and injectable) antidiarrheals such as Kao-pectate and carob flour as well as such home remedies as raw eggs, Gatorade, formalin, household bleach, fresh grated nutmeg and Pepto Bismol.

Microorganisms in infectious scours usually produce death by one or more of three means: 1) through damage to gut villi, causing dehydration and electrolyte imbalance, 2) by producing toxins, 3) by invading the blood stream (septicemia). Reducing or eliminating any of these three causes will enhance the calves' chances for survival.

Materials and Methods

Various approaches have been used in calf scour investigations at the NDSU Department of Veterinary Science. One approach utilizing purchased neonatal calves was to use various ingredient combinations, searching for a combination which would soothe the gut, firm the feces and perhaps slow fecal water loss. The best ingredient combination tested consists of three parts by weight of alginic acid sodium salt (an ingredient used in human food processing as a thickening agent) and one part by weight of propionic acid sodium salt (used as an antifungal agent in some bakery products).

This combination was used on 200 calf scour cases in 1980 and has been used in 35 cases in the spring of 1981. These scouring calves were mainly in beef herds. Calves showing dullness, diarrhea and anorexia were given 10 grams of the mixture thoroughly blended with a quart or more of warm water. The mixture was administered twice daily by esophageal tube. Antibiotics were also used (either oral Equidantin* or Dantafur** or injectable chloramphenicol). Usually one day's treatment with the antidiarrheal was sufficient but it was extended if necessary. Some calves also received oral electrolytes, Lifeguard***.

As is often the case, if something seems to be working, a rancher is reluctant to leave calves as controls, so no reports from the field testing include controls.

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Results

Observations from the attending veterinarian are that the compound produces both fecal firming and a healing or soothing effect on the gastrointestinal tract. The fecal firming is less pronounced with viral type scours than with the *Escherichia coli* scours. Fecal firming is noted in approximately 80% of the animals after two treatments with the antidiarrheal preparation. Also, the soothing effect of the compound on the gut causes anorexic calves to begin nursing much sooner than when only antibiotics and oral electrolytes are given.

Both the attending veterinarian and the beef growers to whom this compound was dispensed feel that it is a valuable adjunct to other scours therapy in beef calves.

* Performance Products, Inc., St. Louis, MO, USA

** Norden Laboratories, Inc., Lincoln, NE, USA

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Comments from beef producers who had used the product on sufficient calves to offer a reasonable appraisal were favorable so far as efficacy is concerned. The chief negative comment was that the material was hard to mix into a solution or was too thick to go down the esophageal tube if not properly mixed. One rancher stated he mixed it the night before using it to overcome the "lumpiness." Another (a dairyman) stated it mixed up fine in a household blender. All suggested that boluses would be easier to administer.

Despite the mixing problems, those interviewed who had used the antidiarrheal on several calves agreed that it firmed the feces and apparently soothed the gastrointestinal tract. One rancher who used it on more than 50 calves during the spring 1980 was very enthusiastic. His calves had viral scours and he had lost several calves prior to using the antidiarrheal. He stated that at least 12 calves were saved that would have died without the product. He has used it on 35 calves during 1981. These calves had *Escherichia coli* type scours and responded even faster than those with viral scours. He indicated that anorexic calves usually began nursing again within 12 to 24 hours of the first treatment.

Most of the ranchers interviewed used 10 grams of the material per treatment given morning and evening. Only 1 or 2 days' treatment was usually required, given in conjunction with whatever other medicants the veterinarian prescribed to produce definite improvement in the calves' condition.

A limited amount of boluses recently have been produced in the laboratory. If the boluses prove satisfactory it may be feasible to incorporate certain sulfas or antibiotics for further testing.

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Production was significantly decreased by all interseeding treatments during the 1978 growing season. The following year, however, there was no significant difference in total production among any of the treatments.

Alfalfa yields on the interseeded plots were highest on the unfertilized 30 cm sod control plot but was not significantly different from the other unfertilized treatments and the low fertility plots. It would appear that the poor stands resulting from the addition of N and P had a detrimental effect on the subsequent years production.

Forage yields in 1980 were well below 1978 and 1979 due to the dry conditions. Analysis of these data showed significantly less grass production on the unfertilized plots where the 30 cm sod control was used. Alfalfa yields were well below the previous year with no significant difference from any of the treatments. Total forage yields were the highest on the two fertility treatments and lowest on the unfertilized 30 cm control plots.

Conclusions:

Results of this and other work (Nyren et al., 1977) at the Dickinson Experiment Station showed that the application of Glyphosate or Paraquat on native mixed prairie for the purpose of sod control for spring seeding is unreliable. While some alfalfa plants became established on the herbicide plots the abnormally high rainfall during the establishment year may have had a more positive effect than the herbicide application.

This unreliability, coupled with the high cost, renders these chemicals undesirable for work on native range.

Interseeding native grasses into good to excellent condition native range has been shown to be of little value in improving overall production. A six year study (Nyren et al., 1978) at the Dickinson Experiment Station showed no increase in production from interseeding green needle grass into excellent condition range. Any increases in production were attributed to the

mechanical interseeding treatment rather than production of the interseeded species.

The failure of Russian wildrye to become established is also consistent with research at Dickinson (Nyren et al., 1978) and Swiftcurrent, Saskatchewan, Canada (Dr. Tom Laurence, personal communications). Russian wildrye seemed unable to compete with the native sod in any of the control widths studied.

Forage production on the mechanically interseeded plots was significantly reduced by all interseeding treatments during the first growing season. Pasture interseeding trials at Dickinson (Nyren et al., 1977) have shown that grazing the first year does not harm the newly seeded alfalfa plants. It has been observed, however, that grazing during the first season with yearling heifers was less detrimental to the newly seeded alfalfa than when cow-calf pairs were used. The calves seemed to use the control strips as walk-ways and in so doing caused more trampling damage.

The unfertilized 30 cm sod control plot produced 438 kg/ha of alfalfa in 1979, 20 per cent of the total production. While this is not a large increase in the total forage production, other work at Dickinson (Nyren et al., 1979) seems to indicate that an increase in beef production can be obtained with 10 to 20 per cent of the total forage production being comprised of interseeded alfalfa.

Literature Cited

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Due to the mild, dry calving season in 1981, scour problems have been minimal. In the future the antidiarrheal preparation may be made available to a limited number of veterinarians or ranchers who would record

and report results from using the compound. It is hoped that continued studies will verify these preliminary field trials.