NORTH DAKOTA
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Guest Column

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Cattlemen, with good reason, have labeled calf scours "the scourge of the cattle industry," "the calf killer," "the profit robber."

As we know, calf scours is not a single disease. Actually, it is a symptom, a common feature to a complex of diseases characterized by diarrhea, followed by dehydration, coma and death.

The seriousness of calf scours ought to be measured by its economic impact. Approximately one million beef cows turn the North Dakota prairies into red meat. Economists tell us that, under present conditions, it takes $350 to $400 per year to maintain and feed a beef cow. Our calf crop averages 850,000 per year, and if only 1 per cent of our calves died from scours our cattle industry would lose at least 3 to 3½ million dollars. This loss could easily reach 15 to 17 million dollars should we lose 5 per cent of our calf crop from scours and related diseases.

Irrelevant of the number of calves lost, calf scours has imposed a significant economic burden on our state's economy. Over the years several attempts have been made to get to the bottom of this problem. Of particular significance was the study funded by the North Dakota Beef Commission during 1975-77. This survey revealed the magnitude of the problem and defined some of the conditions involved with calf scours. More significantly, this study indicated the need to center our resources in efforts to clearly determine specific factors and causes associated with calf scours and provided the basis for the ongoing calf scours research in North Dakota.

Because of the complexity of factors associated with scours, present research efforts encompass studies on environment, management, nutrition, clinical symptoms, infectious agents, immunology, seasonal variations, vaccinations, treatments, and others. Under the leadership of Dr. I. A. Schipper, researchers of the North Dakota Agricultural Experiment Station at Fargo and Dickinson have teamed up with a selected group of cooperating cattlemen and practicing veterinarians.

Their goals? Quite simple to state, yet complex in their attainment: 1. To determine WHY calves get scours, and 2. To design practical means of prevention and/or treatment. The North Dakota Beef Commission has provided financial support and the North Dakota Cooperative Extension Service, W. D. (Wally) Eide in particular, has afforded valuable assistance.

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have a rather narrow margin between effectiveness and safety. Nolvasan (2% chlorhexidine) a disinfectant used by some for calf scours, will cause liver damage at the 100 ml per day level which is reportedly used.

In administering oral antibiotics, it may be of value to recognize that the effectiveness of many antibiotics is reduced when fed with milk or formulas containing calcium or magnesium, according to Price (5). This is especially true for the tetracyclines.

The use of corticosteroids in the neonatal diarrheic calf is not only useless, but may be detrimental, as reported by Lewis (4). It is well to remember that other diseases and complications may accompany diarrhea. Using skill and judgment in applying therapy measures to each individual sick calf will yield the best results.

In summary, presently recommended chemotherapy measures in dealing with neonatal calf scours includes:

(1) Discontinuing milk and substituting balanced oral electrolytes for a day or two in mild cases. In advanced dehydration, injecting balanced sterile electrolyte fluids and replacing some of the lost immune fractions with a liter or more of whole bovine blood, plasma or serum.

(2) Making use of oral compounds having protective, absorbant and/or astringent properties.

(3) Using drugs which will inhibit or destroy pathogenic bacteria.

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This issue of North Dakota Farm Research reflects some of the results of the research efforts on calf scours during the first year of this 3-4 year project. Some of the data may impress you as being too technical, other findings may corroborate facts already known.

Nevertheless, as we assemble this bulletin, a better understanding of calf scours evolves and some of our questions are answered. We realize that infectious agents, such as *Escherichia coli*, coronavirus, rotavirus, and cryptosporidium, often plan an important role in calf scours. We also appreciate the importance of favorable environment, early colostrum intake, maternal nutrition and maternal immunity in the prevention of calf scours.

Perhaps one of the most useful results evolved from the first year of this project is the assurance that personnel of your Veterinary Diagnostic Laboratory at NDSU have developed accurate and expedient technology to identify infectious agents associated with scours. Special efforts were devoted to accurately differentiate pathogenic strains of *Escherichia coli* from those which do not cause scours. The addition of the electron microscope has resulted in rapid identification of scour-causing viruses. A great deal of knowledge has been gained in detecting and isolating coronavirus and rotavirus. Particular emphasis was devoted to categorizing the various types of microscopic lesions observed in scours caused by various infectious agents.

No less important was the knowledge generated from clinical and field observations. It is anticipated that the significance of maternal nutrition, the chemical composition of colostrum, the effects of various vaccinations and the role of environment will receive special attention during the forthcoming years of this project.

It has been suggested in a rather unbenevolent way that every case of calf scours represents a failure of scientific efforts to deal with the problem and that the ultimate goal of related research must be the development of methods of prevention. Inasmuch as calf scours result from both infectious and non-infectious causes, we kid ourselves if we expect "a little bottle of vaccine" as the ultimate result of this research effort. We may obtain better vaccines to deal with certain infections; however, more important than vaccines is an informed cattleman who gears his overall management to preventing the non-infectious causes of scours.

A special recognition is due to those cattlemen who have volunteered their herds as field research laboratories. It is our sincere hope that their efforts, and the dedication of all the people associated with this project, will answer the most important question, "How can we successfully prevent calf scours?" Significant steps already have been taken to achieve this goal.

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On the Cover: Virology is an important part of the calf diarrhea research at NDSU. Technologists Jan Meyer and Randy Ness work in a safety hood isolating and identifying viruses associated with calf diarrhea. Dr. I.A. Schipper (right) observes and directs virus isolation procedures. *Photo by Jim Berg.*