## Preconditioning and Integrating Pre-Purchase Information

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### INTRODUCTION

Practitioners, producers, and researchers have tried to evaluate the merits of bovine health management programs such as preconditioning for many years. Researchers have demonstrated varied results on the benefits of preconditioning. Most research has pointed out program deficiencies (1-6).

The definition of a preconditioned calf is frequently left to the principal investigator. A nutritionist may consider preconditioning as a vaccination program and a veterinarian may consider it as a total management program. This makes comparisons of studies difficult.

A decision making process in herd health and management programs can be implemented by defining the situation, considering the options, studying present knowledge of the options, selecting a strategy, and evaluating the outcome (7). Since the problem with many studies is defining the situation, maybe one should define a non-preconditioned calf.

The original concept of a preconditioning program started in the 1960's and closely resembled the present Integrated Resource Management (IRM) programs of the 1990's. It included the producers, veterinarians, market auction personnel, extension agents, nutritionists, and economists. Great strides in transferring educational information about parasite control and general health practices were documented (8).

In 1988, representatives of state preconditioning programs from South Dakota, North Dakota, Missouri, Iowa, Nebraska, Minnesota, Dr. John B. Herrick, and Dr. James Wasson, representative of the AABP Preconditioning Committee, met in Sioux Falls, SD, to discuss the future of health management programs.

The name of the program was determined to be irrelevant, but scientifically-based, unbiased research was determined to be necessary to establish the economic significance of diseases in the beef industry. It was concluded that studies should be conducted over a broad base of the beef industry on a small number of calves from a large number of production units traceable to the region and farm or ranch of origin. State or federal research programs were not considered likely financial sources for this type of project.

The group agreed upon the importance of providing health information with the cattle as they progress through the marketing channels. The present marketing systems make it difficult to consistently distribute medical histories.

This article is an attempt to challenge AABP members to provide leadership in the acquisition, analysis, and distribution of bovine disease information for the improvement of the entire industry.

Identification and Accountability:

Providing some form of accountability from conception to processing in the beef industry would allow the herd of origin to be evaluated as an individual. Documentation of regional micronutrient deficiencies or toxicities and herd immunity or susceptibility may be possible. Involvement by the National Cattlemen's Association (NCA), AABP, National Meat Board, National Animal Health Monitoring System, and other concerned groups may be required.

The benefit to the individual producer may not justify the expense and effort to identify or modify the situation. However, the spill-over effect of improved health management practices by individual producers or regions may have extremely positive economic ramifications on the entire beef industry (9).

The essentials of a program would be identification of the animals, randomization of elements, and having the ability to repeat the calculations. Producers and their health advisors need flexibility to individualize herd health management programs.

An identification program would provide the industry an over-arching linkage from the cow/calf producer to the packer. The NCA has introduced a standardized production analysis system for economic and production data analysis of the cow/calf production unit. Similar programs are available for feedlot units. An identification program would serve as a cross-cutting approach to linking product accountability throughout the production chain.

A simplistic program to merely identify and document production could be accomplished with the AABP/NCA controlling distribution of the tags. The production chain would be responsible for tagging and maintaining calf medical history.

This program could address food safety/quality assurance issues as well as animal welfare concerns while providing for the collection of the often speculated but rarely document health information.

The crying need for identification is not new. In the October, 1970 issue of The Livestock Feeder, Dr. Herrick referred to "side benefits" of preconditioning and said, "The entire cattle industry is now aroused that more care and regulations should be involved in the movement of cattle. Most certainly the crying need today is identification."

Data Analysis:

When health data is analyzed, one primary variable of interest is focused on and additional variables, either confounders or modifiers, are included. Most acute or chronic diseases are the result of multiple causes. All too frequently in identifying the cause of conditions like the bovine respiratory disease complex (BRDC), the investigator's point of view decides the entity.

The sufficient component causes model was developed to address multi-causality and to provide a definition of interaction. This model defines sufficient cause as one that inevitably results in disease. It assumes that diseases may have multiple sufficient causes. A component cause is any element needed to form the sufficient cause and a necessary cause is one that is present in every sufficient cause (10).

The sufficient component causes model has a number of limitations: (1) it does not link factors with the same actions, (2) it does not differentiate between measured and unmeasured component causes, and (3) it disregards the way one cause may impact other causes to create a disease.

Bovine respiratory disease complex (BRDC) is a primary concern for all cattle producers and one condition addressed by the preconditioning programs. The relationships between all the sufficient component causes remains an important key to uncovering needed information to aid in its treatment, control, and prevention.

People in veterinary medicine have shared beliefs, practices, and structures. Our interventions include testing, laboratory diagnosis, vector control, immunization, treatment, ecology changes, and

education. BRDC commonly has difficulty in fulfilling Koch's postulate as it is a multiple causative disease syndrome, opportunistic organisms are commonly involved, and predisposing causes of latent carriers exist.

Different vaccination combinations have been recommended and new biological products have been developed and implemented into pre-shipment programs. Table 1 illustrates the results from 8,080 cases of bovine respiratory disease in which the listed pathogens were identified. These cases were submitted to the SDADRDL from 1979 through 1991. The summary does not demonstrate significant changes in the prevalence of etiological agents (11).

TABLE 1. Summary of etiological agents isolated from 8,080 submissions to the SDADRDL, 1979-1991.

| Year | Total cases | P. hem. | P. mul. | IBR | PI-3 | BRSV | Haemoph-ilus | Broncho-pneumonia |
|---|---|---|---|---|---|---|---|---|
| 1979 | 920 | 292 | 170 | 71 | 6 | * | 87 | 174 |
| 1980 | 783 | 207 | 190 | 48 | 7 | * | 73 | 173 |
| 1981 | 712 | 211 | 157 | 38 | 4 | * | 102 | 120 |
| 1982 | 651 | 180 | 167 | 22 | 2 | * | 80 | 121 |
| 1983 | 609 | 196 | 136 | 20 | 3 | 16 | 80 | 109 |
| 1984 | 492 | 158 | 111 | 31 | 5 | 21 | 49 | 79 |
| 1985 | 594 | 229 | 131 | 34 | 8 | 12 | 74 | 67 |
| 1986 | 517 | 198 | 113 | 29 | 9 | 11 | 67 | 85 |
| 1987 | 489 | 210 | 98 | 23 | 11 | 63 | 38 | 81 |
| 1988 | 627 | 214 | 113 | 38 | 11 | 50 | 66 | 103 |
| 1989 | 485 | 154 | 109 | 14 | 9 | 45 | 55 | 77 |
| 1990 | 549 | 159 | 110 | 11 | 10 | 38 | 70 | 66 |
| 1991 | 652 | 221 | 106 | 28 | 7 | 39 | 90 | 114 |

* BRSV reporting started in 1983 at the SDADRDL.

Feeding trials in recent years have demonstrated the perceived benefits of dietary crude protein on performance in shipping stressed calves. However, a significant drop in the immune function and health of the calves fed diets containing higher levels of crude protein have been reported (12).

An observation that BRDC wrecks may be linked to the use of MLV, BVD, BRSV vaccines, and Haemophilus bacterins in combination was reported during the 1990 AABP Convention. There was only speculation as to the possible explanations for the linkage (13).

The recently publicized health management practice of vaccinating cattle upon feedlot arrival and re-vaccinating numerous times in short time intervals has testimonials of successfully reducing morbidity and mortality (14). Martin et al (15) found that using vaccines against respiratory disease in times of stress appeared to increase the risk of mortality.

Most herd health and management programs are eventually evaluated through a cost-benefit analysis (CBA). This analysis of livestock disease control program frequently produces misleading results. The results generated by CBA are not necessarily wrong, but we do not know when they are valid. This problem will not be resolved until broad-based data is collected and analyzed on economically relevant information of livestock diseases (16).

Health management practices are extremely difficult to accurately evaluate without health history of the animals involved. Only the

performance data of cattle with known medical records and following suggested practices should be included. Herd immunity, prior vaccinations, latent infections, marketing practices, and nutritional management can all confound the evaluation process (17).

Information Transfer:

In the past, preconditioning programs have mandated certain management practices. These mandates and suggestions have varied widely from state to state (18), practice to practice, and year to year.

A controversy has existed over mandating bovine virus diarrhea (BVD) vaccination. Twenty years ago, Dr. John B. Herrick conducted a survey of 20 veterinary colleges asking if BVD vaccine should be mandated in a pre-weaning program. The results of the survey were 10 to mandate and 10 not to mandate. This information did not clarify the vaccine usage, however, practitioners were informed that scientists had not resolved the question.

The way drug companies market their products to the livestock industries is a prescription for inefficient medicine and a major contributor to confounding and bias associated with livestock health management practices.

For the most part, companies provide accurate information about new products and medical advances, but sometimes exaggerate their importance or present an unbalanced view of other treatments.

"Exploiting Animal Health Product Sales" was the title of an article recently published in Farm Store magazine. The article emphasized concentrating sales on the major product lines sold by the principal animal health companies as they provide the people and name-brand recognition for successful dealer pull-through marketing (19).

Drug companies spend billions of dollars on advertising, travel and incentives, newsletters, phone services, organized educational symposiums with free meals, provide numerous educational publications, and fund many research projects.

A survey of North American veterinary colleges and biological companies on health management recommendations for the nursing calf is currently in progress. The results will be summarized and presented during the 1992 AABP Convention.

The AABP could assist state bovine committees and practitioners in making scientifically-based health management decisions by selecting a panel represented by each veterinary college and veterinary science department in the U.S. and Canada to contribute unbiased management information on an annual or biannual basis. This counter dealing would be based on the latest scientific literature.

## CONCLUSION

Since the first AABP conference 25 years ago, scientists, veterinarians, producers, and managers have generally agreed that the concept of preconditioning is theoretically correct. Most notoriety and attention have been given for identifying program deficiencies without constructive recommendations on ways to strengthen the concept. Many people addressing the issues over the years have stayed attached to their primary area of interest and have not pulled together for the best interest of the entire beef industry. The most recent resurgence of interest by the NCA in the IRM concept provides a tremendous opportunity and challenge to the AABP members to assist the beef industry in the development of an over-arching, cross-cutting health monitoring system to lead the beef industry into the

**References**

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