

A Three Year Field Study of Preconditioning Native Illinois Beef Calves Sold Through a Cooperative Marketing Association – 1969 to 1971

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ABSTRACT

During the fall of 1969, 1970 and 1971, Central Illinois practitioners preconditioned (PC) 1,576 beef calves at a cost range of \$3.02 to \$4.72. The PC program included weaning calves 30 days before sale, having calves eating grain from a bunk and drinking from a tank, vaccinated against blackleg, malignant edema, infectious bovine rhinotracheitis (IBR) and bovine parainfluenza virus (PI3). Calves were tagged in the right ear with the green certified preconditioned for health (CPH) tag of the American Association of Bovine Practitioners. Bovine virus diarrhea (BVD) vaccine was added to the program in 1970 and 1971 since clinical cases of the disease occurred in PC calves not receiving the vaccine in 1969. Intranasal PI3 vaccine and *Pasteurella hemolytica* and multocida bacterin was added to the 1971 program to attempt better immunization. In 1969, more PC than non-preconditioned (NPC) calves were treated for acute respiratory disease after sale. The 1970 study showed that fewer PC than NPC calves were treated for acute respiratory tract disease. The 1971 finding showed the greatest differences. A comparison of 389 PC and 227 NPC calves sold at auction in 1971 and moved into the same feedlots showed a statistically significant reduction in number of cases of acute respiratory tract disease treated in PC calves. Generally, PC calves sold at a higher price than NPC calves.

RÉSUMÉ

Au cours de l'automne des années 1969, 1970 et 1971, les praticiens du centre de l'Illinois expérimentèrent, chez 1,576 veaux de boucherie, un programme de conditionnement dont le coût varia de \$3.02 à \$4.72 par tête. Ce programme consistait à sevrer les veaux 30 jours avant de les vendre, à leur donner accès à un auge de grain et à un réservoir d'eau, ainsi qu'à les vacciner contre le charbon symptomatique, l'oedème malin, la rhino-trachéite infectieuse bovine (RIB) et le para-influenza (PI3). On identifia ces animaux dans l'oreille droite, à l'aide du médaillon vert CPH ("Certified Preconditioned for Health") de l'association américaine des praticiens en médecine bovine. En 1970 et 1971, on ajouta la vaccination contre la diarrhée à virus bovine (DVB), parce qu'en 1969 on avait observé des cas cliniques de cette maladie chez certains des veaux inclus dans le programme auxquels on n'avait pas administré ce vaccin. En 1971, on utilisa en plus un vaccin intra-nasal contre le virus PI3, ainsi qu'une bactérine contenant *Pasteurella hemolytica* et multocida, dans le but d'améliorer l'immunisation. En 1969, on traita plus de cas de maladies respiratoires aiguës chez les veaux inclus dans le programme que chez ceux qui ne l'étaient pas. L'année suivante, le contraire se produisit. Les résultats obtenus en 1971 démontrèrent les différences les plus appréciables. Une comparaison portant sur 389 veaux inclus dans le programme et 227 qui ne l'étaient pas, qu'on vendit aux enchères en 1971 et qu'on transporta ensuite dans les mêmes parcs d'engraissement, démontra une réduction valable du point de vue statistique, relativement au nombre de cas de maladies respiratoires aiguës qu'il fallut traiter chez les premiers. En général, les veaux faisant partie du programme commandaient un prix plus élevé que les autres.

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INTRODUCTION

The term "preconditioning" has been defined as a program to minimize economic loss caused by stress and disease during the transfer of calves from the cow herd to the feedlot (1). A prior study of this method of attempting to reduce losses showed a very encouraging advantage compared to beef calves not preconditioned (9). Co-operative feeder calf sales furnish a useful method of marketing beef calves for Illinois farmers. Calves are assembled from many farms, weighed, graded, and sold at auction in uniform lots. Outbreaks of acute respiratory disease frequently occur and present a problem to the buyer. This is exemplified by a study of acute respiratory diseases in calves and yearlings sold through six cooperative Illinois auctions in the fall of 1966 which showed that 30% were treated for acute respiratory tract disease and 0.47% died (7).

In 1969, Calvin Cowsert, an Illinois livestock extension advisor at Shelbyville, and the other authors met with the Board of Directors of the Eastern Illinois Livestock Association to plan a preconditioning program. The following report describes the program and gives the results of the three years of study. The procedures adopted were generally those recommended by the American Association of Bovine Practitioners and the A.V.M.A. Panel Report on Bovine Respiratory Disease (1, 2).

MATERIALS AND METHODS

In the fall of 1969, fecal samples were collected from 10% to 15% of the calves in cooperating herds for examination for gastrointestinal nematodes. These samples were examined as previously described (5).

Three to four weeks before the sale in the fall of 1969 and 1970, recommendations were that calves be weaned and acclimated to grain if they were not on creep feed. In addition, they should be accustomed to drinking from a tank. For several years, the sale had required that dehorning and castration be performed well in advance of the sale. In 1969, all calves received malig-

nant edema and blackleg bacterin,¹ IBR-PI3 vaccine,¹ and were wormed with thia-bendazole boluses according to body weight at least three weeks prior to sale date. In 1970, similar IBR-PI3 combination vaccine¹ plus bovine virus diarrhea vaccine¹ was used three weeks or more in advance of the sale. In 1971, intranasal PI3 vaccine was used in combination with IBR-BVD vaccine.¹ In addition, two doses of a combined bacterin of *Clostridium chauvei-septicum* and *Pasteurella hemolytica* and *multocida* were given two to three weeks apart. Preconditioned (PC) calves were tagged by the veterinarian in the right ear with the green certified preconditioned for health (CPH) tag recommended by the American Association of Bovine Practitioners.² Non-preconditioned (NPC) calves served as controls. NPC calves were separated from their dams and shipped directly to the sales barn.

At the sale, CPH calves were graded for quality, type and condition by university representatives and grouped with PC calves from other farms. Buyers of preconditioned calves were given a sheet at the sales office informing them of the procedures carried out on the CPH calves. In addition, they were urged to phone their local veterinarian if calves sickened so that acute and convalescent serum samples could be collected. Periodic phone calls and some farm visits were made to feedlots by the authors (Woods and Pickard). The final

¹In 1969, Rhivax P-Modified live IBR-PI3 vaccine, Pitman-Moore Co., Indianapolis, Ind. was used. In 1970, Reaplex-Modified live IBR-PI3 virus, Ft. Dodge Lab., Ft. Dodge, Iowa and BVD vaccine, Modified live virus, Jensen-Salsbury Laboratories, Kansas City, Mo., was used. In 1971, Electrogen CSP Bacterin, Nasalgen P-Modified live bovine myxovirus parainfluenza for intranasal use was given plus IBR-BVD vaccine-Modified live virus — all from Jensen-Salsbury Laboratories, Kansas City, Mo.

²National Band and Tag Co., Newport, Ky.

TABLE I. Number and Size of Central Illinois Beef Herds Cooperating in a Three Year Preconditioning Study

Size of Herd	Number of Herds by Year		
	1969	1970	1971
1-10	0	1	7
11-20	10	9	17
21-30	5	4	5
31-40	0	1	5
41-50	1	1	1
51-60	0	1	2
61-70	0	0	0
Over 70	1	0	0
Totals	17	17	37

TABLE II. Number of Calves Preconditioned During a Three Year Period and Cost Per Head for Drugs, Biologics and Professional Service

Year	No Herds Cooperating	No Calves Preconditioned	Cost Per Head
1969	17	429	\$3.05
1970	17	408	3.02
1971	37	739	4.72
Totals	—	1576	—

tabulations of number of calves treated for acute respiratory tract disease were made from a questionnaire mailed to the owners. The comparisons were limited to those farms where both preconditioned and non-preconditioned cattle from the sales were purchased and mixed in the same feedlot. This approach was followed in order to permit a more valid comparison by reducing the variables in evaluation of results. This type of comparison allows diverse management factors to affect both the preconditioned and non-preconditioned populations of calves with known history.

RESULTS

A total of 1,576 calves were preconditioned. Size of herds consigning calves to the sale ranged from four to 80 head. The number of relatively small herds emphasizes the popularity of the cooperative feeder calf

auction as a marketing method. No severe adverse clinical reaction to the vaccines used was reported. In 1971, one practitioner reported that calves in two herds showed some systemic reaction five to seven days after the first vaccination but recovered quickly. One calf developed pharyngeal edema of unknown etiology. There was some problem in loss of ear tags between the farm and the sales center. The plastic bangles provided with the tags were not used. A summary of the number of herds and calves in the project is summarized (Table I).

The cost of veterinary service, drugs and biologics varied from \$3.02 per head in 1970 to \$4.72 in 1971. The increased cost of the 1971 program was due to use of two doses of *Pasteurella* bacterin (see footnote¹) plus use of intranasal PI3 vaccine which cost more than the intramuscular type. The costs are summarized in Table II. PC calves sold at a higher price than NPC cattle at the three sales. The sales prices of the two groups are summarized (Table IV).

In 1969, the results showed that more cases of acute respiratory disease were treated in preconditioned than non-preconditioned calves. Results for 1970 showed some improvements in reduction of clinical respiratory disease treated in preconditioned lots, but the difference was not great nor statistically significant. The greatest difference between the two groups in number of cases treated was in 1971 when twice as

TABLE III. Reported Cases of Acute Respiratory Disease Treated in Preconditioned and Non-preconditioned Illinois Beef Calves Purchased at an Auction and Mixed in the Same Feedlot — 1969-1971

Year	Preconditioned						Non-preconditioned					
	No Herds	No Cattle	No Treated	%	No Died	%	No Herds	No Cattle	No Treated	%	No Died	%
1969 ...	14	287	103	36.0	6	2.1	14	330	75	23.0	3	0.9
970 ...	7	229	54	24.0	0	0.0	7	205	62	30.3	3	1.5
971 ...	10	389	38	9.8	1	0.3	10	229	45	20.0	5	2.6

TABLE IV. Three Year Comparison of Average Price/Cwt Paid for Preconditioned and Non-preconditioned Beef Calves Sold at an Auction

Year	Steers			Heifers		
	Pre-conditioned	Not Pre-conditioned	Price Differential	Pre-conditioned	Not Pre-conditioned	Price Differential
1969	\$34.32	\$31.95	\$2.27	\$29.18	\$28.63	\$.55
1970	36.72 ^a	33.35	3.37	31.45 ^a	28.81	2.64
1971	38.38 ^b	35.48	3.40	34.51	34.33	.18

^a4-H Club calves not included

^bOne lot of five steers at \$58/cwt not included

many clinical cases of respiratory disease were reported treated in the non-preconditioned lots. These results are summarized in Table III. In the 1969 study, calves from 13 of 19 herds had more than 300 gastrointestinal nematode eggs per gram of feces.

DISCUSSION

The results from the 1971 trial showed the greatest advantage for the preconditioning program in preventing clinical respiratory disease following shipment. The difference was statistically significant at ($p = < .01\%$) when calculated by the chi square method. This may have been due to the use of intranasal PI3 vaccine (4), together with two doses of *Pasteurella* sp. bacterin given before the sale. *Pasteurella hemolytica* has been reported as especially important in bovine respiratory disease (3). Additional work is needed to evaluate the level of protection afforded beef calves vaccinated with live virus IBR, PI3 and BVD vaccines even though they do not develop detectable levels of circulating antibody using presently available laboratory tests (8).

The use of two doses of bacterin containing both *P. multocida* and *P. hemolytica* two to three weeks apart before shipment seems a logical addition to a total PC program due to the high prevalence of *Pasteurella* sp. in cattle populations. Their use may aid in the reduction in death loss noted after shipment of non-preconditioned calves. The use of an efficient drug to prevent clinical effects of internal parasitism as seen in Central Illinois calves seems justified, but it is recognized that there is a difference of opinion as to the role gastrointestinal nematodes play as a detriment to feedlot calves on good rations (6).

Many owners did not use veterinary service and many did not have adequate facilities to confine calves for collection of serum samples. Calves that died were not submitted for necropsy so causes for these losses were not determined. A representative cross-section of the PC and NPC calves sold at the three auctions were purchased and studied at the Veterinary Medical Research feedlot at Dixon Springs Agricultural Center. The results were quite comparable with the finding in this report.

The results from the 1971 study indicate that a PC program essentially similar to

Plan 1, American Association of Bovine Practitioners (1), markedly reduced clinical respiratory disease after shipment of Illinois beef calves from an auction market for one change of ownership. Not all respiratory tract disease was prevented, but morbidity and mortality was reduced. A common observation by many buyers of PC calves was that they started to eat grain quickly, which apparently helped NPC calves to start eating more quickly. The smaller price differential between preconditioned and non-preconditioned heifers (Table IV) was thought to be due to their demand for replacement breeding stock.

Study of preconditioned and non-preconditioned populations of calves to determine morbidity from respiratory tract disease after sale is valuable. Even though specific etiological diagnosis of the clinical respiratory disease that occurs in such populations may not be known, epidemiological analysis is useful when conditions of the study such as described and history of the calves are known. The procedures used in preconditioning calves should be stated in detail so that the buyer and seller of calves and the veterinarian know the history.

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