Dairy Section

Dr. Dave Reid, Chairman

Herd Health Presentation

R. D. MacKay, *D.V.M.*
Peterborough Veterinary Services
720 The Kingsway
Peterborough, Ontario, Canada

I would like to begin my presentation by expressing my appreciation to the American Association of Bovine Practitioners, not only for the opportunity of presenting my views today on the subject of herd health, but also for the encouragement and leadership that this association has provided to those of us who have chosen to serve agriculture through the application of the science of veterinary medicine at the farm level. It is my humble opinion that the AABP, through the influence it has exerted on large animal practice in North America, may well be conisdered by future historians as one of the major contributors to the advancement of animal food production of this century. My own involvement in programmed herd health is the product of the advice and guidance of my colleagues, both in our own profession and in the related faculties of agriculture. To my associates and staff at Peterborough Veterinary Services, I say "thanks," it is because of your willingness to carry the load on many occasions that I have been able to devote so much of my energies to the development of this segment of large animal practice.

Given the complexities of agriculture today, it becomes obvious that although crisis medicine will always play some role, the trend must be to a programmed approach to solving the problems of the producer. The involvement of our profession will be judged solely on the value of its contribution to the overall productivity of the industry. If we accept optimum production with a minimum of disease-related problems and incurred costs as our goal, then it becomes obvious that the maintenance of herd health becomes important only through its contribution to the overall productivity of the herd. Under programmed herd health, the status of the individual is considered only in the light of its effect on the herd as a whole. Productivity, with its many contributing factors, then becomes the key to the success of the operation. The veterinarian who assumes the role of providing a herd health service must of necessity address himself to the various disciplines that contribute to that productivity.

Today, I would like to discuss the programmed herd health approach under the following headings: 1) Herd Health–Definitions, Goals and Objectives. 2) Herd Health–The Total Approach. 3) Personnel Involved in the Herd Health Program. 4) Specific Areas of the Herd Health Program–Methods, Goals, Results. 5) The Role of the Veterinarian.

Definitions, Goals and Objectives

Programmed herd health has been defined by the WVMA as: Any pre-arranged schedule to provide the farmer with a comprehensive program of prevention in the broad field of veterinary medicine.

We have used the goal of optimum production with a minimum of disease-related problems and incurred costs as the basis of our program. Basically, the program must increase the farmer's net income or it will be difficult to justify.

The objectives of the program can be briefly stated then as: 1) It must establish a level of health within the herd that is concurrent with the most economically optimum level of disease control. 2) It must extract maximum profit from the herd at the most optimum cost per unit of production. 3) Although primary responsibility is to the producer, it should ensure a wholesome, reasonably-priced product to the consumer. 4) It would be hoped that the program would, in itself, enhance the quality of life for the individual involved.

Herd health has been a part of organized veterinary medicine in Ontario since the early 1960's. The work of Borfoot, Cote, Stone and Wright, published in the CVMA, January 1971, established the conclusive proof of the advantages to the farmer of preventive medicine. The concept has been widely discussed in the farm press and farm groups and individual farmers have pressed for such a service; and yet, by and large, the establishment of successful herd health programs has been sporadic throughout Canada.

In Ontario, as is the case in most of Canada with the exception of the province of New Brunswick, the development of herd health has been left mainly to the initiative of the individual practitioner. There are, no doubt, various reasons why herd health has not become more widely applied. However, it would seem that if the concept is to become a contributing factor in agriculture, then it is time that our profession accepted the responsibility of developing suitable guidelines, providing workshops for upgrading the profession in the management of programmed herd health, and encouraging the universities to provide opportunities for advanced training in the area of programmed herd health.

The Total Approach

Specifically, the herd health program is concerned with eight interrelated areas: 1) client education; 2) mastitis control; 3) reproduction; 4) nutrition; 5) general health; 6) environment; 7) record-keeping; 8) provisions of emergency service.

Personnel Involved

Herd health is a complex service the perimeters of which are not in the grasp of any one individual. No one person is capable of being competent in the many faculties that are required to service today's complex farm unit. The service requires a team of qualified persons, each capable in their particular field, willing and able to apply their particular skills to improve the productivity of our agriculture industry. The complexities of the industry place the average farmer in an almost impossible situation; although he may be very competent in the basics of agriculture, he finds himself bogged down not only by the extreme work load, but also faced with a wide range of problems for which he has little formal training to solve. In the past, although technical help has been available, too often it has been applied in a piecemeal approach. It becomes the responsibility of the veterinarian to act as a catalyst and provide the avenues of communication that ensure that the activities of each individual become a part of the team approach charged with the responsibility of increasing the productivity of that farm.

Specific Areas of the Herd Health Program

I. Client Education

It becomes the veterinarian's responsibility to ensure that the learning process becomes an integral part of farm management: 1) Exchange of information during scheduled visits to the farm. 2) Fact sheets, handouts, newsletters. 3) Periodic client education meetings where there is an exchange of information, not only from speaker to farmer but also farmer to farmer. Many of our more successful clients have a wealth of information that can be passed on to our less experienced. 4) Interpretation of farm periodicals and journals. 5) Education of the public at large on matters pertaining to agriculture and its contribution to our present-day affluency.

Remember, the well-informed client realizes his limitations, seeks professional advice, understands the complexities of the situation and follows instructions. The uninformed client blunders on, often not understanding the problem and unaware of the services that we can provide.

II. Mastitis Control

The negative influence that sub-clinical mastitis exerts on productivity has been adequately demonstrated. The National Mastitis Council estimates that lost income to the United States dairy industry from reduced milk production alone amounts to over one billion dollars annually or just over $140 per cow. Joe Misner of the Milk Industry Branch, Ontario Ministry of Agriculture and Food, estimates a preventable loss to Ontario dairymen of $32,252,000. The province of New Brunswick, with 513 producers, loses over one million yearly. The reduction in sub-clinical mastitis to an acceptable level will more than compensate your client for the cost of the herd health services.

Steps involved in establishing a successful mastitis program as a part of programmed herd health:

1). Establish the infection level within the herd using various perimeters: a) herd survey–quarter samples, culture and sensitivity, CMT scores, % infected cows, % infected quarters, % strep, % staph; b) monthly CMT on bulk samples from each cow and record % clinical flare-ups, strep counts on bulk tank samples; c) Milk Marketing Board information, MGI, WMT, somatic cell counts, plate loop counts, pasteurization counts; d) % cows freshening with mastitis.

2). Establish the economic significance of mastitis in the herd using NMC figures for lost production.

3). Establish goals: a) % infected cows 5-10%; b) CMT negative cows $> 80\%$; c) plate loop count ≤ 3000; d) MGI-0, somatic cell count $< 250{,}000 < 100{,}000$ feasible; e) clinical flareup $<2\%$; f) cows freshening with mastitis $<1\%$.

4). Steps in attaining the goals: a) interpretation of laboratory reports, set up appropriate treatment schedule; b) implementation of proper milking procedures and hygiene; c) upgrade equipment to NMC standards; d) teat dipping preferably beginning 10 days before freshening and continuing for 10 days post-drying off; e) dry cow therapy; f) attention to housing, yards, etc.; g) management of dry cows, dry cow area, freshening facilities and early fresh cows; h) constant monitoring of the herd to ensure the goals are maintained.

III. Reproduction

Although reproduction plays an extremely important role in the maintenance of productivity, it may be that many of our so-called herd health programs in the past failed because they centered entirely around the reproductive tract. The work of D.M. Galton, H.L. Barr and L.E. Hieder, *Journal of Dairy Science*,

BRIEF SUMMARY
(For full prescribing information, see package insert.)

Lasix®(furosemide)* Powder Packet (2g)

A diuretic-saluretic for prompt relief of edema.

CAUTION: Federal law restricts this drug to use by or on the order of a licensed veterinarian.

INDICATIONS

Cattle:

Lasix* (furosemide) is indicated for the treatment of physiologic parturient edema of the mammary gland and associated structures.

CONTRAINDICATIONS – PRECAUTIONS

Lasix* (furosemide) is a highly effective diuretic-saluretic which, if given in excessive amounts, may result in dehydration and electrolyte imbalance. Therefore, the dosage and schedule may have to be adjusted to the patient's needs. The animal should be observed for early signs of electrolyte imbalance, and corrective measures administered. Early signs of electrolyte imbalance are: increased thirst, lethargy, drowsiness or restlessness, fatigue, oliguria, gastrointestinal disturbances and tachycardia. Special attention should be given to potassium levels. Lasix* (furosemide) may lower serum calcium levels and cause tetany in rare cases of animals having an existing hypocalcemic tendency.

Although diabetes mellitus is a rarely reported disease in animals, active or latent diabetes mellitus may on rare occasions be exacerbated by Lasix* (furosemide).

Electrolyte balance should be monitored prior to surgery in patients receiving Lasix* (furosemide). Imbalances must be corrected by administration of suitable fluid therapy.

Lasix* (furosemide) is contraindicated in anuria. Therapy should be discontinued in cases of progressive renal disease if increasing azotemia and oliguria occur during the treatment. Sudden alterations of fluid and electrolyte imbalance in an animal with cirrhosis may precipitate hepatic coma; therefore, observation during period of therapy is necessary. In hepatic coma and in states of electrolyte depletion, therapy should not be instituted until the basic condition is improved or corrected. Potassium supplementation may be necessary in cases routinely treated with potassium-depleting steroids.

WARNINGS

Lasix* (furosemide) is a highly effective diuretic and, as with any diuretic, if given in excessive amounts may lead to excessive diuresis that could result in electrolyte imbalance, dehydration and reduction of plasma volume, enhancing the risk of circulatory collapse, thrombosis and embolism. Therefore, the animal should be observed for early signs of fluid depletion with electrolyte imbalance, and corrective measures administered. Excessive loss of potassium in patients receiving digitalis or its glycosides may precipitate digitalis toxicity. Caution should be exercised in animals administered potassium-depleting steroids.

Sulfonamide diuretics have been reported to decrease arterial responsiveness to pressor amines and to enhance the effect of tubocurarine. Caution should be exercised in administering curare or its derivatives to patients undergoing therapy with Lasix* (furosemide) and it is advisable to discontinue Lasix* (furosemide) for one day prior to any elective surgery.

CATTLE: Milk taken from animals during treatment and for 48 hours (four milkings) after the last treatment must not be used for food. Cattle must not be slaughtered for food within 48 hours following last treatment.

Lasix* (furosemide) is not indicated during the second trimester of pregnancy.

DOSAGE AND ADMINISTRATION

The usual dose of Lasix* (furosemide) is 1 to 2 mg/lb body weight (approximately 2.5 to 5 mg/kg). A prompt diuresis usually ensues from the initial treatment. Diuresis may be initiated with Lasix* (furosemide) Injection 5% and maintained by oral treatment following a 12-hour interval.

DOSAGE:

Oral: CATTLE

The contents of 1 packet (2g) per cow daily to be administered with the animal's individual concentrate ration. **Treatment not to exceed 48 hours postparturition.**

Parenteral: CATTLE

The individual dose administered intramuscularly or intravenously is 500 mg (10 ml) once daily or 250 mg (5 ml) twice daily at 12-hour intervals. **Treatment not to exceed 48 hours postparturition.**

HOW SUPPLIED

Parenteral:

Lasix* (furosemide) Injection 5% (50 mg/ml)

Each ml contains: 50 mg furosemide as a diethanolamine salt preserved and stabilized with myristyl-gamma-picolinium chloride 0.02%, EDTA sodium 0.1%, sodium sulfite 0.1% with sodium chloride 0.2% in distilled water, pH adjusted with sodium hydroxide.

Available in 50 ml multidose vials.

Oral:

Lasix® (furosemide) 2g Powder Packet

Each packet contains 2g of furosemide: 4-chloro-N-furfuryl-5-sulfamoylanthranilic acid plus inert ingredients.

Available in boxes of 12 packets each.

NOW

Lasix®
(furosemide)
Powder Packet (2g)

A new way to treat udder edema in cows.

Safe - No risk of abortion.

Effective - Two-day therapy rapidly relieves edema, thereby lessening the risk of permanent udder damage.

Convenient - Empty contents of one packet per cow daily for two days as a top dressing on grain mixture.

Palatable - Readily accepted by cows.

Economical - No stress and associated milk loss with a feed top dressing. Milk production maintained following "milk-out" period.

AVAILABLE ONLY FROM LICENSED VETERINARIANS

Lasix* (furosemide) 2g Powder Packet
Manufactured By:
Hoechst-Roussel Pharmaceuticals Inc.
Somerville, N.J. 08876

Lasix* (furosemide) Injection 5%
Manufactured By:
Taylor Pharmacal Co.
Decatur, Illinois 62525

Manufactured expressly for:
National Laboratories Corp.
Subsidiary of American Hoechst Corporation
Somerville, New Jersey 08876

*U.S. Patent 3,058,882

Printed in U.S.A.

Edition 12/78 N188-1278

Vol. 60, July 1977, discusses the effect of a herd health program on reproductive performance on dairy cows, establishes the economic benefits of such a program and is an excellent study for demonstration purposes. In the implementation of the overall program, reproduction becomes a part of the total concept. Although examination must of necessity involve the individual, we must approach reproductive problems with the following points in mind: 1) Evaluate the problems from a herd standpoint. 2) Emphasis must be on prevention rather than individual treatment through: a) client education–estrous detection and breeding management; b) nutrition; c) specific vaccination programs; d) prevention of injuries and infections at calving time; e) routine reproductive examinations and proper management of reproductive tract disorders; f) selective culling.

Essentially, the reproductive tract examination is carried out on a monthly or bi-monthly basis depending on herd size. The importance of the pregnancy diagnosis should be de-emphasized in the importance of the routine reproductive tract examination.

The examination should include: 1) all cows having abnormal delivery, retained placenta and/or abnormal discharges; 2) all cows having abnormal estrous cycles; 3) all cows fresh 15-30 days; 4) all cows not seen in heat by 45 days postpartum; 5) problems breeders–cows bred 2-3 times, not pregnant; 6) pregnancy check all cows bred 35 days; 7) periodic rechecks to pick up cows that have experienced early embryonic death or mummification; 8) accurate recording of all findings.

Your greatest contribution to this part of the program should be in insuring that all cows have cycled and are ready to be bred by 60 days postpartum.

Reproductive performance is measured by the length of the calving interval. There are certain components of the calving interval on which the success of the program will depend.

Components of the calving interval that must be considered are: 1) days to first heat; 2) days to first breeding; 3) heat–heat periods (days); 4) services per conception; 5) percent of cows pregnant on pregnancy diagnosis; 6) percent of cows calving to first service.

The goals of a reproductive program are: 1) nonvisible estrus $<15\%$; 2) cows showing heat by 60 days postpartum $>85\%$; 3) cows conceiving on first service $\geq 70\%$; 4) cows calving to first service $\geq 60\%$; 5) services per conception ≤ 1.6; 6) problem breeders $\leq 10\%$; 7) heifers bred by 15 mos. (800-850 lbs., Holstein); 8) days open <100 (75-90); 9) calving interval 12-13 mos.

IV. Nutrition

It is my opinion that any preventive medicine program must have as its basis a sound nutritional program. Today's dairy cow, because of her genetic potential for production, the availability of high energy grains, and the emphasis that has been placed on production, has been pushed to levels of production that are often not supported by a properly balanced ration and adequate crude fiber intake. I am sure that all of you have experienced herds that have become plagued with nutritional and stress-related problems–ketosis, parturient paresis with the downer cow syndrome, DA's, reproductive problems, fat cow syndrome, udder edema, mastitis, laminitis and its sequelae–just as they reach the level of production that they have been striving for.

Apart from respiratory, contagious and parasitic, the conditions commonly encountered in dairy cattle have been classified as production disease (Payne, 1971) or parturition syndrome (Sommer, 1975). Payne, in his classification, includes the commonly encountered metabolic diseases and names an imbalance of nutrient intake and production which leads to a metabolic breakdown as the etiologic factor. Sommer, in his parturition syndrome, identifies imbalances in the quality and quantity of nutrient intake; especially prior to calving, as the underlying cause of a breakdown in liver function. Parturition is the common stress that triggers the breakdown in animals with reduced liver function. He suggests that the effects of liver damage is accumulative, so that animals, after their third or fourth lactation, are more commonly affected. Sommer, in his concept of the parturition syndrome in the high-producing dairy cow, includes all of those pathological processes that occur during the final stages of pregnancy, parturition and early lactation: metabolic diseases, retained placenta, fat cows, DA's, mastitis, metritis, and related fertility problems, anestrus and foot problems. It is not the high production *per se* that is the problem, but feeding errors, especially prior to calving, with parturition and the beginning of lactation as the exciting causes. He and his colleagues are able, with some degree of accuracy, through a series of liver function tests at drying off, to identify the animals that will fall into the parturition syndrome category. Metaphylaxis is carried out during the dry period and is aimed at correcting the nutritional mistakes and attempting to improve liver function.

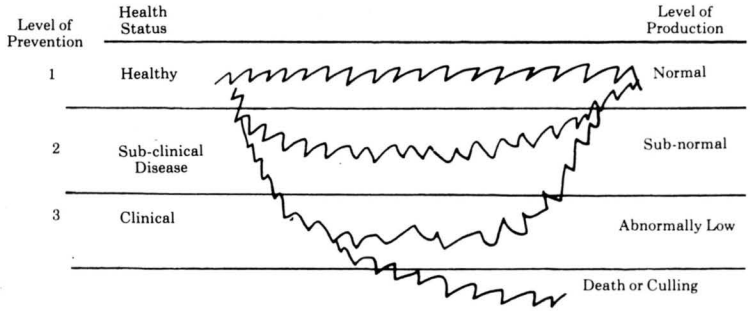
A good nutritional program should be designed to: 1) Make best use of available grains and roughages, utilizing nutrient analysis. 2) Be adaptable to the feeding system on the farm. 3) Stabilize milk and butterfat production. 4) Challenge the cow to produce her genetic potential. 5) Provide balanced rations for a) milking cows; b) dry cows; c) replacements. 6) Reduce the incidence of nutritional and nutrition-related diseases. 7) Improve reproduction. 8) Provide optimum growth rate in replacements. 9) Provide "best cost" rations. 10) Reduce cost per unit of production, i.e., feed costs per 100 lbs. of milk produced.

Feed Bunk Management: Under present-day conditions it would seem that the "art of feeding dairy cattle" is quickly giving way to the science of nutrition. Complicating this trend is the replacement of the old-time dairyman, whose keen sense of observa-

tion and life-long exposure to cattle make him a master at the "art of feeding cattle," by hired help, farm managers and agri-business owners whose main emphasis is on production and profit. This combination seems to be leading more and more to feeding errors which are not only extremely frustrating to the nutritionist, who has, in all probability, done an excellent job of balancing the ration, but is often devastating to the health and production of the herd. It is necessary that the herd health veterinarian have a thorough understanding of the physical properties of the ration, the mechanics of preparation, the proper harvesting and storage of roughages and, above all, the physiology of digestion and milk production. It is your responsibility to ensure that that finely tuned ration is delivered to the cow in a manner that will ensure maximum conversion of the nutrients to milk and milk fat.

V. General Health

Traditionally, the role of the large animal practitioner has been closely aligned with the general health of the herd. Because of a formal training and background that has emphasized the individual, many veterinarians have difficulty in making the transition from the individual to the herd concept. Although the individual diagnosis and treatment will remain a part of veterinary medicine, to the herd health specialist its importance must be considered in light of its effect on overall herd performance. Disease control at the herd level can not be considered an all-or-nothing effort. In any given situation, there is an optimum level of disease control.



The Relationship of Disease Prevention Health Status and Level of Production. (Martin and Meek, OVA, 1978)

The optimum level of prevention will be influenced by several factors, including the resources available, the cost of these resources, their effect on the level of production of the end product and the price of the end products. Simply stated, disease control will be considered worthwhile up to a point where a dollar spent on prevention returns a dollar's worth of end product.

The herd health program should emphasize prevention through: 1) Client education on the etiology, predisposing and contributing factors, and his role in disease prevention. 2) Adjustment of environmental factors. 3) Specific vaccination programs, certain prophylactic measures, i.e., magnets. 4) Nutrition. 5) A planned approach to internal and external parasite control (A.C. Todd, D.H. Bliss, J.W. Crowley and L. Grisi, Economic Impact of Parasitism in Dairy Herds). 6) A planned approach to dehorning, hoof trimming, removal of supramammary teats, dewclaw removal. 7) Testing and isolation of non-natural increase herd additions. 8) Systematically record and analyze disease incidence within the herd using diagnostic indicators and culling rate.

Many of the common diseases can be significantly reduced through herd health and a proper nutritional approach.

VI. Environment

The veterinarian, because of his training in etiology and the contributing factors of disease, is probably the most qualified person on the team to relate the stress of the environment to the health and productivity of the herd. Although you are not expected to become agricultural engineers, builders or ventilation specialists, it is important that you develop sufficient knowledge to provide positive input in this area. Within the realm of sound engineering principles, reasonable cost and approved building standards, the environment should be designed to maximize cow comfort, productivity and operator efficiency.

VII. Records

The record system provides the foundation for the herd health program. Essentially, record systems in present use are like many herd health programs, tailored to the individual's needs and preferences. The development of a practical, efficient system for maintaining records would seem to be of primary importance. Obviously, the future lies in automated systems from which data will be easily retrieved.

The record system should provide: individual records; herd information; nutritional information; and housing and equipment information.

A. Individual records: 1) Identification, birthdate, etc. 2) Reproduction history. 3) Mastitis history. 4) General health history. 5) Placement of offspring; 6) Production information: a) average production; b) kg/lactation % fat; c) BCA milk and fat; d) deviation from herd average. 7) Individual milk graphs.

B. Herd records: 1) Herd production information: a) average production kgs/yr.; b) BCA milk and fat. 2) Herd mastitis information: a) herd surveys, culture and sensitivity; b) % clinical flare-ups; c) MGI, WMT, or somatic cell counts, bacteria counts; d) milking machine maintenance, records, information. 3) General health: use accepted diagnostic indicators. 4) Reproduction information: a) days to first heat; b) days open; c) services per conception; d) percent calving to first service; e) calving interval. 5) Nutritional information.

VIII. Emergency Service

Under the best of plans, emergencies will still occur. A primary concern of our profession will always be to assure that emergency service will be available.

The Role of the Veterinary Profession

North American agriculture has experienced in the last decade a period of unprecedented upheaval and socio-economic change. The transition from small family farms to large, integrated agri-business units has been rapid in the traditionally highly productive areas of this continent. Although in Canada we are still dealing mainly with smaller units, usually operated by the farm family, economics has dictated that these units become highly efficient if they are to compete in the marketplace. Farming is no longer a way of life. The margin of profit is small. The late congressman, Jerry Linton, in his address to the AABP in December 1974, stated that if all on-farm profits were eliminated in the U.S.A., the cost of living would be reduced by mere cents a day.

Under present economic conditions, even our best farmers will be hard-pressed to survive; many will not and will fade from the agriculture scene completely. Be that as it may, a hungry world must be fed and I am confident that the North American agricultural community will continue to lead the way in productivity and efficiency. The farmer of the present decade will evolve as a bold new agriculturist, vitally concerned with agri-business management, agri-economics and efficiency, and automated records will become a part of the future scene. Large animal practice, whether we like it or not, is closely linked to agri-economics. Whether we are to survive and become a viable contributing element in what I consider to be an exciting and challenging industry depends on those of us who are in the field along with the educators of our new graduates.

In the words of Dr. Haynes of Cornell University, "Cattle practice is a professional business that, just like any other business, must be aggressive and innovating to survive. The modern farmer is under no compulsion to employ veterinary services–it must be proven to him by practitioners, organized veterinary medicine and the universities that veterinary service is a sound investment, strictly on the basis of economics." It is my opinion that if we are to fulfill the criteria of that statement, we must abandon our traditional role. If veterinary medicine is to truly serve agriculture in the future, surely it must be in the field of preventive medicine and programmed herd health.

Economic Survey of a 38-Cow Herd Experiencing Severe Financial Problems During the Winter of 1977-78.

Production Costs:

Feed Costs Per Cow Per Day:
Dairy Ration at .07 ¢/lb.
Home Grown Grain at .04 ¢/lb.
Roughage (Hay) at .02 ¢/lb.

Dairy Ration	.07 x 12 lbs./day	= 0.84 ¢/day
Home Grain	.04 x 12 lbs./day	= 0.48 ¢/day
Roughage	.02 x 31.5 lbs./day	= 0.63 ¢/day
		$1.95/cow/day

$1.95 x 38 Cows = $74.10 feed cost/day

Feed Costs/Day

$74.10 x 30.4 = $2,252.64 feed cost/month

Income and Feed Costs

Milk Production per month 28,555 lbs./month
Feed costs per month $2,252.64
Feed costs per 100 lbs. of milk:

2252.64/28,555 x 100 = $7.89

Income Over Feed Costs

Blend price of milk per cwt.	$11.65
Feed costs per cwt. of milk	$ 7.89
Income Over Feed Costs	$ 3.76

Feed costs generally represent 50% of the cost of producing milk.

∴Theoretical cost of producing milk on this farm:

Feed costs x 2	= $15.78
Income/cwt. of milk	= $11.65
Income/cwt. of milk	$ 4.13

= Net Loss of $4.13/cwt. of milk produced.

Factors Contributing to Net Loss

1. Milk Production Lost Because of Poor Udder Health

CMT Score	No. of Qrts.	Lbs. Milk Lost/Qrt.	Per Day
1	7	1.85	12.95 lbs.
2	11	2.95	32.45 lbs.
3	54	4.13	223.02 lbs.
Total Loss per Day			268.42 lbs.

268.42 x 11.65 = $31.27/day

31.27 x 365 = $11,413.55/yr.

Loss Recoverable 80% = $9,130.84

2. Reproduction Failures

Days open	160
Acceptable days open	100
Days lost	60
Cost per day lost	$2.00

60 x 2.00 = $120/cow/yr.

120 x 38 = $4,560/yr.

Services per conception averaged 3

Represents loss of $10.00/cow/yr.

38 cows at $10.00 = $380.00

Recoverable 50% = $190.00

2 cows were milking 2 years and not pregnant.

8 heifers were 2 years old and not bred.

This represents 1 full lactation for 10 animals.

If 10 cows averaged 7000 lbs. milk/lactation
then 7000 x 10 x 11.65 = $8,155.00 lost income.

Total Calculated Amount Loss. Gross.

1) Poor udder health	$11,413.55
2) Prolonged calving interval	$ 4,560.00
3) Increased services/conc.	$ 380.00
4) Delayed breeding 10 animals	$ 8,155.00
Total Loss	$24,508.55

Total Calculated Recoverable Income. Gross.

1) Mastitis loss 80%	$ 9,130.84
2) Reduce days open to 100 at $2.00/day	$ 4,560.00
3) Reduce services/conception	$ 190.00
4) Eliminates lost prod. 10 animals	$ 8,155.00
Total	$22,035.84

Calculated Change in Gross Income by

1) Increase productivity by 3000 lbs./cow
2) Decrease feed costs to acceptable level $5.00/cwt.

Present Income

38 cows produce annually 342,660 lbs. of milk

Income	342,660 x 11.65	=	$39,919.89
Feed Cost at 7.89/cwt.	342,660 x 7.89	=	$27,035.87
Income over feed costs			$12,884.02.

Projected Income (Accomplish 1,2)

38 cows produce annually 479,220 lbs. milk

Income	479,220 x 11.65	=	$55,829.13
Cost at 5.00/cwt.	479,220 x 5.00	=	$23,961.00
Income over feed costs			$31,868.13

Change in Net Income if Feed Costs Represent 50% of Cost of Producing Milk.

Present			
Income	342,660 x 11.65	=	$39,919.89
Cost	342,660 x 15.78	=	$54,071.74
Net Income (Loss)			$14,151.85
Projected			
Income	479,220 x 11.65	=	$55,829.13
Cost	479,220 x 10.00 (500 x 2) = (10.00)		$47,922.00
Net Income (Gain)			$7,907.13

Economic Survey of a Herd Enrolled on a Herd Health Program and a Nutritional Program.

Year	Milk Prod., lbs.	Fat Prod., lbs.	BCA
1968 to 1974	12,336 to 15,952	487 to 660	116-123 to 146-158

Year	Clvg. Int., mos.	Days Open
1969	14.5	163
1974	12.5	100
	2 mos.	63

Production Increase

Year	Milk, lbs.	Fat, lbs.	BCA
1974	15,952	660	146 158
1968	12,336	487	116 123
	3,616	173	30 35 + points

Income 1974 over 1968

Per Cow 3616 x 10.00	$360.00
Reduction in days open, 63 x 1.50	94.50
	$454.50
42 Cows at $454.00 =	$19,089

Changes in Infection Level and Lost Income in a Herd Enrolled on a Mastitis Control Program.

Herd status when enrolled in the program:

37 cows
Positive cows 68%
Positive qrtrs. 39%

CMT Rdg.	No. of qrts.		Milk loss/qrt.		Milk loss/day
1	38	x	2.18	=	82.84
2	11	x	3.88	=	42.68
3	14	x	5.74	=	80.36
					205.88 lbs./day

Loss at $10.00/cwt. 205.88 x .10 x 365 = $7,511.70

7 months after enrolling in the program:

36 cows
Positive cows 17%
Positive qrtrs. 6%

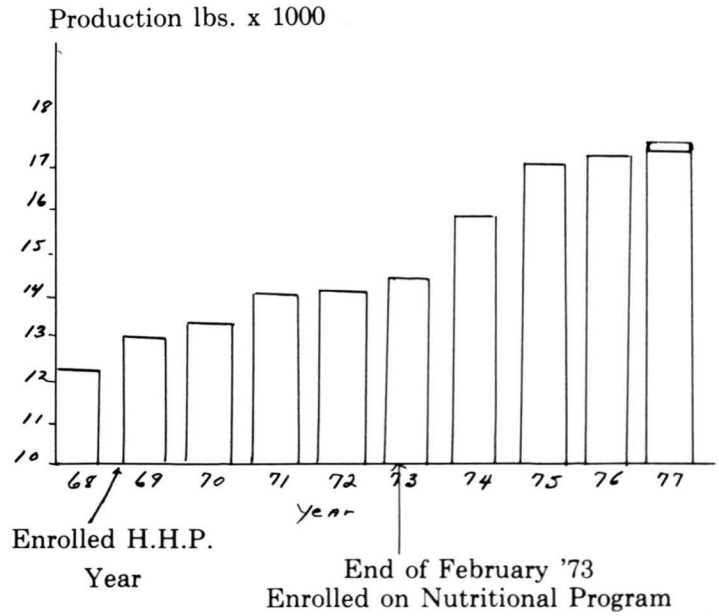
CMT Rdgs.	No. of qrts.		Milk loss/qrt.		Milk loss/day
1	10	x	2.18	=	21.80
2	6	x	3.88	=	23.28
3	1	x	5.74	=	5.74
					50.82 lbs./day

Loss at $10.00/cwt. 50.82 x .10 = $5.08/day x 365 = $1,854.20/yr.

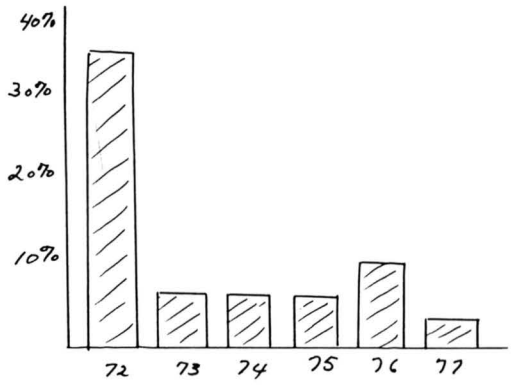
Status 3 years later:

60 cows
Positive cows 5%
Positive qrtrs. 1.127%

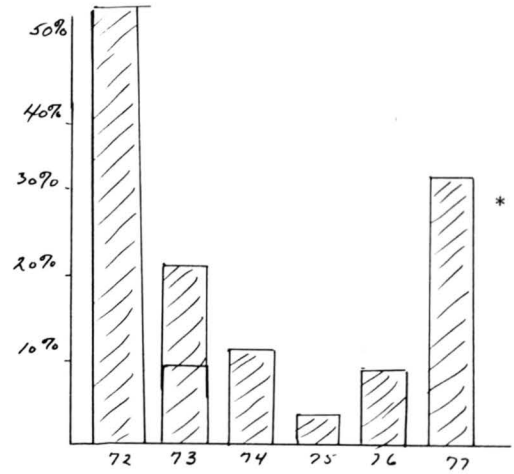
CMT Rdgs.	No. of qrts.		Milk loss/qrt.		Milk loss/day
1	14	x	2.18	=	30.52
2	4	x	3.88	=	15.52
3	6	x	5.74	=	34.44
					80.48 lbs/day



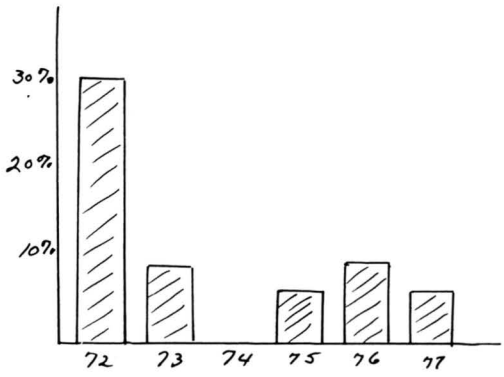
Production Response: Herd Enrolled on Herd Health Program.



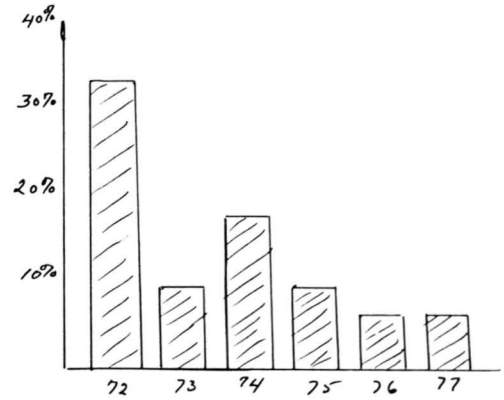
Milk Fever Rate–Herd on PGH and Nutritional Plan.



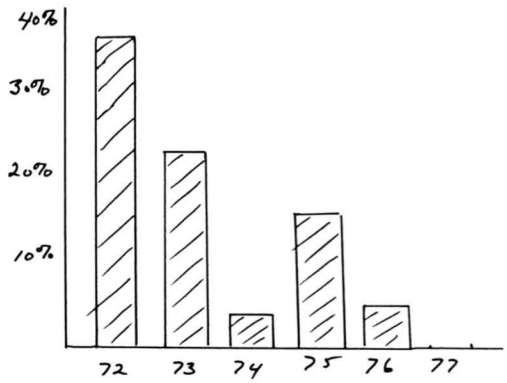
*Clinical Mastitis Rate–Herd on PGH and Nutritional Plan. *Dry cow treament change increase mainly due to number of cows freshening with the mastitis.*



Acetonemia Rate–Herd on PGH and Nutritional Plan.



Retained Placenta Rate–Herd on PGH and Nutritional Plan.



Foot Problems–Herd on PGH and Nutritional Plan.