# Dairy Herd Health in New Brunswick

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SUMMARY

The broad areas of herd health programs in New Brunswick involve mainly mastitis control, reproductive efficiency and nutrition. The significance of these programs is related to milk production and the benefits to the animal owners are quantified. The importance of checking for proper function of milking machines and improved efficiency in heat detection are stressed. Coordinating milk production and nutritional requirements can prevent disease problems as well as increase the efficiency of production and requires regular feed analyses. Specific diseases are discussed in relationship to the herd health program and the importance of communication with animal owners is stressed.

RÉSUMÉ

**La médecine préventive dans les troupeaux laitiers, au Nouveau-Brunswick**

Les programmes de médecine préventive des bovins laitiers, au Nouveau-Brunswick, s'intéressent surtout au contrôle de la mammite, à l'efficacité de la reproduction et à l'alimentation. Ces programmes visent à améliorer la production de lait et on calcule les profits qu'en retirent les fermiers. Cet article fait ressortir l'importance de vérifier le bon fonctionnement des trayeuses et l'amélioration dans la détection des chaleurs. La coordination de la production de lait et des besoins nutritifs peut contribuer à prévenir les maladies et à améliorer la production de lait; cette pratique suppose des analyses d'aliments régulières. L'auteur commente certaines maladies spécifiques en rapport avec un programme de médecine préventive; il insiste sur l'importance de la communication avec les éleveurs.

Before discussing dairy herd health in New Brunswick a short review of vital statistics may be in order. New Brunswick has a human population of approximately 675 000; its area is 27 473 square miles of which 85% is forest. The province is about 1/12 the size of Ontario and 1/10 the size of Alberta. The dairy and beef population has fluctuated: 1971:121000, 1976:112000, 1978:113000. In the Sussex area, dairy and beef total 23 000 with dairy comprising 19 000 of that total.

There are 500 fluid milk shippers in N.B., 155 of whom are in the Sussex area. The province also has 420 cream producers. The average number of milking cows per herd is 42.

The N.B. Veterinary Branch of the Department of Agriculture was formed in the late 1930's and was in fact the beginning of veticare or socialized veterinary medicine in North America. At the present time there are 23 district veterinarians as well as a director, pathologist, swine specialist (part-time) and a large animal clinic specialist on staff. The Sussex office started in the early 1940's as a one-man practice and additional veterinarians were added in 1952, 1975 and 1980.

A number of practitioners had been carrying out preventative medicine in varying degrees over the years, but a formal dairy herd health program was established in 1975 by the Department of Agriculture.

Producers who wished to participate contacted their local veterinarian and signed an agreement outlining the responsibilities of the parties involved. In many cases the farmer became interested in pregnancy diagnosis, then proceeded to postpartum checks, heat detections, and was concerned about days open and the calving intervals of his cattle. Mastitis control and prevention had been discussed with producer groups in the early sixties, when the California Mastitis Test became popular. With the advent of the N.B. Milk Quality Control Laboratory and the monthly reporting of somatic cell counts in a herd basis, the farmer had some means to assess his program and make adjustments when necessary.

We try to have a monthly visit for larger farms milking 50-200 cows, and a six-week period for some of the smaller shippers. The fee schedule is on an hourly basis plus drug costs and we supply individual record cards plus a monthly worksheet to keep up-to-date lists of animals to be checked. The record keeping of our herd health program is probably the weakest part. It seems difficult to motivate producers to carry out this task, which is essential for measuring improvement and for setting and evaluating goals.

An accurate figure on the number of herds on the program is not available. However, in our district, 60 are on the official plan and 30 unofficial; nevertheless, the latter groups receive a very similar service. Due to this demand for herd health programs, another veterinarian has been added to our district.

*Milk Production*

Total milk production in N.B. has increased 6.31% in 1978 over 1977 and increased 6.9% in 1979 over 1978. Class I sales (fluid milk) increased 4.28% in 1978 and over 1977 made up 73.95% of total production and in 1979 had dropped to 69.40%.

It is expected that by June of 1981, N.B. will have used all its market share quota (M.S.Q.) and overproduction will then result in a cash penalty per hectolitre against the producer. The dairy farmer also has to be keenly aware that both the fluid milk quota

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and M.S.Q. must be produced or some quota could be lost.

The DHAS records for 1979 show many herds in N.B. producing 6 804 kg (15 000 lb) plus a few herds over 7 257 kg (16 000 lb) per cow, heifers included. The average was 5 454 kg (12 000 lb).

The Record of Performance (ROP) records are higher, the top-producing herd in Atlantic Canada had 8 514 kg (18 770 lb) and also had the top four-year old Holstein in Canada with 13 154 kg (28 179 lb) in 305 days with a BCA of 258 for milk and 224 for fat.

It is interesting that timothy hay and a high-energy dairy ration made up the diet of this cow; however, she has a tremendous ability to eat hay and consumes 27-29 kg (60-65 lb) a day.

*Forages*

With more emphasis on producing better forages, and with a testing program and a nutritionist added to the staff, we are now better able to fulfil the nutritive requirements of the cows and to increase production.

Cattle in N.B. in the winter depend mainly on non-legume hay or haylage (timothy) for forage. The average crude protein on an as-fed-basis for hay has increased from 8.2% in 1977 to 9.0% in 1979.

Many farmers produce corn silage. However, there often is a problem in getting the corn mature enough to cut, resulting in too high a moisture content. Some progress has been made in this area, dry matter (DM) in 1977 averaged 23.2% and in 1979 it was 28.0%.

The building of tower silos has increased significantly in the past two years, changing forage feeding on some farms to haylage and less long-stem hay. Results of the analysis of samples of 1979 haylage submitted to Fredericton laboratory were: dry matter 43%, range 24% - 75%; crude protein 11.7%, range 8% - 19%; average digestible protein 54%, range 23% - 70%. It is quite evident from these figures that forage testing is essential if cows are to peak to their capacity. Corn silage with high moisture content, hay or haylage low in crude protein or with caramelization (heat damage) will result in low milk production unless the grain ration is adjusted. After tests on forages are completed, the nutritionist will recommend the type of dairy ration appropriate for each farm.

The demand for more grain feeding is often a problem in free-stall barns unless extra feed is available, other than that eaten in the milking parlour. Magnetic feeders seem to have assisted in this area, and nonpelleted feeds can be used, along with the rumen buffers sodium bicarbonate and magnesium oxide, when necessary to help control the fat depression syndrome (low butterfat).

*Bypass Protein*

The feeding of wet brewery grains has been a common practice in our district for many years, but the actual role this protein supplement plays in stimulating milk production has only been ascertained recently. The area of protein nutrition for ruminants has evolved over the past few years to a point where terms such as crude protein and digestible protein provide only a partial description of the usefulness of a protein source to the ruminant.

A new area of study which has provided many new descriptive terms is the concept of bypass proteins. Bypass protein refers to a protein source which is not degraded in the rumen, but is passed into the lower gut of the animal, unaltered by rumen microorganisms.

This new concept in protein nutrition is aimed at providing sufficient protein to maintain a healthy rumen microorganism population synthesizing protein at a maximum level and providing a high quality protein source for digestion and absorption postruminally, thus making best use of both of these aspects of ruminant protein metabolism.

*Mastitis*

Mastitis control and prevention has to be an important aspect in a herd health program. Monthly somatic cell counts and streptococci counts can be helpful in assessing the level of mastitis in the herd. Somatic cell counts in N.B. for the last four years were as follows.

| Somatic Cell Counts | Frequency 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|
| < 250 000 | 10.8 | 19.5 | 29.1 | 30.4 |
| < 500 000 | 43.4 | 45.2 | 43.0 | 44.4 |
| < 750 000 | 30.6 | 25.8 | 20.7 | 19.5 |
| < 1 000 000 | 10.1 | 7.3 | 6.0 | 5.0 |
| > 1 000 000 | 5.1 | 2.2 | 1.2 | 0.6 |

A steady decline in somatic cell counts is evident. About 20% more producers had somatic cell counts of less than 250 000 in 1979 than in 1976.

A number of studies have confirmed that for every 100 000/mL rise in somatic cell counts, there is a loss of 100 litres (227 lb) of milk per cow per year. It is evident, therefore, that 45% of our producers are losing an average of 150 litres per cow per year. The blend price is C $0.33 per litre and the average herd size is 42, leading to a loss of C $3 069 per year per farm. The loss of milk due to subclinical mastitis from all producers with cell counts above 250 000/mL is 3 221 716 litres or C $1 063 166. Add to this the loss of revenue from discarded milk, indurated quarters, cows sold for meat or which die due to acute mastitis, the cost of drugs and veterinary services. The total is staggering.

In order to reduce these losses the first step is to have milking equipment checked by a competent service representative. Many systems have been installed, then added to over the years with little knowledge of the effects on the cows. However, there is no guarantee that a new system will work well, because some are poorly installed.

Since milking equipment is used at least twice a day every day on living tissue, it must be kept in good working order. To be done correctly, maintenance checks should take place under full load at milking time, not in the middle of the day with only one machine on the line. Many uncorrected little problems can add up to one insurmountable problem at a later date. Plugged vents in the claw, worn vanes, over-loaded systems, malfunctioning pulsators and inadequate vacuum lines are a few of the "little things" that can explode as mastitis at a later date. In the long run, mastitis will cost more than the repairs will in the short run. At milking time a check can be made on udder preparation for milk letdown, timing of teat cup placement and removal as well as teat dipping and transient voltage problems. Culture and sensitivity tests should be done to establish the possible source of an infection in a problem herd. Muddy yards, wet or cold saw-

dust bedding, poor sanitation in treating dry cows, not using dry cow preparation or inadequate housing are some areas to investigate in making a diagnosis.

The significance of streptococcus milk counts in 200 herds in the Fredericton and Sussex areas was carried out for six months (July to January) using a selective media.

Streptococci udder pathogens may sometimes comprise over 90% of the bacterial flora in high count (100 000/mL) herd milk. This can be due to:

1) general subclinical mastitis,
2) one or two acutely infected cows,
3) buildup of streptococci in milk residues between milkings or in poorly cooled milk and
4) a mixture of any of the above causes.

The majority of herds had counts less than 2 000/mL with the typical count being 500/mL. Less than 10% of the herds with streptococci counts of 500/mL had somatic cell counts greater than 500 000/mL. The typical somatic cell count for this group was 200 000/mL. The above data indicates that healthy herds have streptococci counts of less than 500/mL.

*Pregnancy Diagnosis*

During a routine herd health visit, we discuss any problems with acute mastitis or subclinical mastitis, calf rearing and milk production, but our main thrust is toward bovine fertility or infertility. Pregnancy diagnosis is done at 35-40 days and these cows are rechecked on the next visit to pick up any early embryonic deaths or to confirm the original diagnosis.

*Heat Detection and Postpartum Checks*

Heat detection is still a problem on many farms and is not necessarily confined to tie stall barns. The level of protein, carbohydrate and phosphorus must first be evaluated in the total ration. I feel minerals should be in the ration and producers cannot rely on the cow's eating enough free-choice minerals to supply her needs.

Postpartum checks after three weeks are done to check for proper involution of the uterus, metritis, pyometra, adhesions, ovarian cysts, etc. and to stimulate heat. Herdsmen are more aware of the importance of heats in their cows at 15 to 21 days, at 40 to 50 days so that after 60 days they can breed them. Since standing heat is the major physical sign that the cow is ready to breed, we encourage dairymen with tie-up stalls to have an exercise yard in which to turn out the animals that need to be bred. Many times this is not done and we are asked to check cows to determine their estrous cycle. Ideally, a turgid uterus and a large ovarian follicle can confirm heat; the size and consistency of the corpus luteum aid in predicting heat.

*Retained Placenta and Metritis*

Retained placenta is another challenge and veterinarians in N.B. and elsewhere differ in their approach. My personal view is not to remove a retained placenta or use uterine boluses or infusions just after calving, but have the owner check the cow's temperature twice a day even if she is eating well. If a fever develops, an antibiotic is administered. In some cases, after five to seven days the placenta may be removed by slight traction on it from outside the vulva or just inside the vagina. For cows which had a retained placenta or metritis, gonadotropin releasing hormone (GnRH) is given intramuscularly at ten to 14 days postpartum; this will bring the cows into heat or at least increase uterine tone to evacuate the contents. Prostaglandins are also used for metritis but are not recommended until a functional corpus luteum can be palpated and in some cows this occurs 25 to 30 days after calving. If metritis or endometritis is still evident the cow is given an intrauterine infusion of antibiotics.

*Repeat Breeders*

Repeat breeders are still a problem at times. For those cows that come into heat every three weeks and no abnormalities can be found, 50 to 60 mL of 1.5% Lugols iodine solution in normal saline is infused into the uterus six to 24 hours postbreeding. A number of farmers find this treatment very helpful. Gonadotropin releasing hormone is also used before breeding on some cows, especially those that have had irregular heat periods but no signs of cystic ovaries or metritis on rectal palpation. A combination of GnRH and prostaglandins may be used for cystic ovaries especially when a luteal cyst is present. In cases where ureaplasma has been diagnosed, 20 mL of rolitetracycline[1] is infused postbreeding, taking special care not to carry the bacteria from the vagina into the uterus. This can be done by using a plastic glove in the vagina and then forcing the insemination tube through it into the cervix.

*Prostaglandins*

Prostaglandins have added a new dimension to dairy practice. They can be very useful but if we inject an animal to bring her into heat and do not first check for pregnancy and get a good history, a disaster can occur. About 50% of so-called "silent heat" cows can be successfully bred using prostaglandins, provided a functional corpus luteum can be palpated. They are bred at 72 and 96 hours after the prostaglandin treatment or at the first heat period. The conception rate for tied-up heifers can be much higher; in one herd 27 out of 32 conceived on first service. Prostaglandins are also used to abort (up to 120 days) heifers bred too young or mismated. Cows induced at term usually calve within 24-36 hours and have fewer retained placentas than those treated with steroids. For cattle bred to eight months pregnant that the owner wants aborted, a combination of steriods and prostaglandins works well. This treatment is also effective in treating hydrops amnion or hydrops allantois. Some of the cows that are induced to calve develop a form of uterine inertia; the cervix is fully dilated, but the cow does not strain and if not assisted, this condition may continue for many hours. Whether the size of the calf, or low serum calcium is responsible, it is important to instruct the farmer when to examine these cows.

*Fertility*

The influence of high production on conception rates has been discussed and research trials have been done, with conflicting results. Some recent work in North Carolina indicates that overall there was no evidence that con-

[1]Reverin, Hoechst Pharmaceuticals, Montreal, Quebec.

ception rate in either Holstein or Jersey cows was greatly affected by milk production level. It did not matter whether milk yield was expressed as 70 day yield or deviation from herdmates, the effect was not significant. It was stated that the conception rate in both Holsteins and Jerseys was related positively to the level of progesterone in blood samples collected during two weeks before insemination. Cows that had higher levels of progesterone had higher conception rates. It is not known what factors control progesterone level, but in Jersey cows progesterone level was related to body weight change. Jersey cows which gained weight three to four weeks before insemination had higher blood levels of progesterone than those losing weight. This same relationship was not found in the Holstein breed.

The role of β-carotene in bovine fertility has received a great deal of attention lately. It is known that the highest concentration of β-carotene is in the corpus luteum. According to scientists in West Germany, low blood levels of β-carotene are associated with weak signs of estrus or silent heat, delay of ovulation by about one day, higher incidence of ovarian cysts, lower progesterone levels in the corpus luteum and blood serum, abortions and increased calving interval.

Last year we fed β-carotene to five cows in a herd that was having some problems in heat detection and in conception rates. Even though this was not a scientifically controlled trial, the results are interesting. The five cows conceived from the first breeding, four less than 60 days after calving and the fifth at about 100 days. The remainder of the herd which is in a free stall setup, were slower to show heat and had a lower conception rate.

This fall 15 cows from the same herd were tested for Ca, P, and Mg as well as β-carotene serum levels. All cows were fed β-carotene this winter, starting two weeks before calving and stopping after conception. Even though the trial has not been completed, indications are that there has been an improvement in heat detection and conception rates.

Some preliminary data suggest a connection between β-carotene deficiency, low hyroxine (T4) concentration and interrupted pregnancy.

*Dry Cows*

High production has placed the dairy cow under great stress and how she is handled during the dry period is quite often reflected in her next lactation. The last 60 days of lactation should be included in the discussion about the dry cow. It is during this time that many cows become too fat, just from overfeeding, and also at this stage of lactation, feed is converted more readily into fat. These obese cows are more prone to calving difficulties, hypocalcemia, acetonemia, retained placenta, metritis and displaced abomasum.

*Milk Fever*

In herds in which milk fever is a problem we also try to limit the calcium intake and increase phosphorus. Only non legume hay or haylage is fed and a dry cow's ration that is low in calcium and energy is recommended. In some cases these dry cows will only need hay supplemented with vitamins and minerals if they are fleshy. About ten to 14 days before calving a regular dairy ration should be fed to allow the rumen microorganism to become adjusted to grain digestion.

Milk fever-prone cows can be given one million IU of vitamin $D_3$ per 45 kg of body weight and the next day treated with prostaglandins so they will calve during the time when the $D_3$ is having its optimum effect. A well-bedded calving pen is extremely important to prevent leg injuries.

Cows that have been treated for hypocalcemia take from two to seven days to return to lasting normal calcium levels. We are really just keeping the cow living so that her absorption of calcium from the intestinal tract and the bone will meet her requirements. The loss of calcium to produce milk is not the only cause of hypocalcemia, as cows in late lactation also develop the condition. A high incidence of hypocalcemia has been reported in a herd of mastectomized cows.

One important factor to consider in calculating the losses from parturients paresis is a reduction of 3.5 years in a cow's productive life after an attack has occurred. This is another reason why prevention is so important.

## CONCLUSIONS

The New Brunswick Dairy Herd Health Program is really in its infancy. We still have a way to go before the dairy farmer reaches a high degree of efficiency in producing milk.

Some areas the producer has to watch are: early feeding of colostrum (one to two hours after birth), vitamins A and D, selenium and alpha tocopherol treatment. If feeding milk replacer to calves under three weeks, he should examine the tag for fibre, fat and protein content. There is a tendency to overfeed young calves, 6 to 10% of body weight of milk daily, along with a calf starter, is sufficient. Top quality forage and a heifer ration should be fed after weaning to insure a healthy start so that this animal can be bred to calve around 24 months of age. Control of internal and external parasites must be undertaken.

A proper dry cow feeding program to prevent metabolic disease is important. Deworming cows the day before or after calving can increase milk production about 182 kg (400 lb) per cow per lactation on some farms. Use of sawdust in maternity pens is to be avoided as this predisposes to acute mastitis with Gram negative bacteria.

Herds that have a somatic cell count above 250 000/mL are losing money due to subclinical mastitis. In some cases the cause is milking too many cows in late lactation or a high ratio of older cows to heifers, to meet the milk quota.

Dairymen should aim for a twelve month calving interval and in order to do this they must realize that it costs C $2 to C $3 per day per cow, depending upon the farm, if pregnancy is not attained by 85 days.

A successful herd health program depends on the veterinarian's ability to communicate with clients, to keep them informed on new management practices, vaccines, antibiotics, biologics, etc. Periodic meetings with producer groups for a three to four hour session is extremely important. If the farmer is familiar with the bovine genital tract and has seen a corpus luteum, oviducts, follicles or cysts at one of these meetings, he has a better understanding of the veterinarian's prognosis and treatment in the field of reproduction.

Whatever success the Dairy Herd Health program has attained, the main credit has to be given to Dr. David MacKay of Peterborough Veterinary Services for his untiring effort in consulting with veterinarians on our staff as well as producer groups.