

NYS CATTLE HEALTH ASSURANCE PROGRAM CALF HEALTH MODULE: AN IN-DEPTH ASSESSMENT TOOL FOR CALF MANAGEMENT

M. Hemenway¹ and G. Bertoldo²

¹NYS Department of Agriculture & Markets

²Cornell Cooperative Extension

The New York State Cattle Health Assurance Program is an integrated disease prevention program that utilizes a team of advisors to develop a farm-specific herd health plan. The objectives of this plan are to:

- Increase the herd's health, productivity and profitability,
- Assure food safety, public health and consumer confidence in dairy products,
- Promote environmental stewardship.

The NYSCHAP farm team is comprised of the NYSCHAP herd planner (NYS Field Veterinarian or certified NYSCHAP Veterinarian), the producer, the herd veterinarian, key farm employees and other consultants used on the farm. Baseline information is collected and a walk-through risk assessment is completed. Intervention strategies are developed within the goals and resources of the farm operation and are the basis for the herd plan. The herd veterinarian will work with the producer over the next year to ensure progress is made with the herd plan.

NYSCHAP is a voluntary program that is sponsored by the NYS Department of Agriculture and Markets. There is no enrollment fee for participation. Herd veterinarians are compensated for their time in the planning process by the NYS Department of Agriculture and Markets. Herd plans are herd specific and will be created within the goals and resources of the farm operation. Some plans will incorporate changes in management practices (BMPS's) while other plans may include disease testing or facility changes. All farms enroll in the core module which is basic biosecurity and BMP's that cross all management areas and disease issues.

The core module of the program is represented by the hub of the wheel consisting of general "best management practices." These best management practices occupy the center of the health assurance wheel because they will benefit production, animal health, food safety, product quality and ultimately profit, regardless of the pathogen or herd stressor involved. The individual modules "spin off" from the core and contain detailed and specific interventions designed to impact a particular issue or pathogen on the farm. The farm plan developed by the NYSCHAP team is farm-specific for each module. For example, if a producer wants to work towards the establishment of a Johne's control program, elements of the core best management practices are implemented, along with specific interventions designed to control and reduce Johne's disease on that farm.

NYSCHAP CALF HEALTH MODULE

Heifer calves are raised as replacements for lactating cows and are essential to the successful future of the dairy. The greatest mortality and morbidity period for dairy cattle is from birth to weaning. Management goals for the first 6 to 8 weeks of a calf's life should be to minimize disease and mortality by providing a suitable environment, establishing a quality nutritional program and implementing a preventive health care plan.

The genetics of this heifer determine what her potential is. How she is raised, fed and managed determine what she will actually do. When a heifer freshens, someone has at least a two-year investment in her with no return on that investment up to that time. Her longevity in the milking herd and her milking ability will determine whether that investment is returned along with a reasonable profit. Longevity and milking ability are highly related to how she was raised.

Rearing healthy dairy calves requires maximizing the calf's level of immunity against disease while minimizing its exposure to infectious agents. Improving a calf's level of immunity requires proper colostrum management, a quality nutrition and vaccination program, and minimizing environmental and other stressors. Minimizing the risk of exposure to infectious agents requires excellent environmental management, good housing, sanitation, and control of potential disease carriers such as people, animals or equipment. Producers should work with the herd veterinarian to design a calf health management program including a sound colostrum management program, a sound vaccination program for replacement heifers and cows, protocols for handling newborn calves, and protocols for the daily monitoring of calves to detect disease and make treatment decisions.

The goal of raising dairy heifer calves is to produce an animal that is suitable as a replacement at the dairy. The typical dairy, for a number of reasons, culls 25-35% of the milking herd each year. This indicates that a large number of replacement heifers are needed. The ideal replacement heifer

- Weighs 1300 pounds or more at freshening without being fat
- Is in good health
- Will be no more than 24 months of age at calving
- Is genetically and physically a more desirable animal than the one she is replacing.

Recent data from USDA: NAHMS put pre-weaned calf mortality at 7.8 percent in the U.S. (2007). In addition, morbidity remains high, which adds to the economic burden through added labor and health supply costs; over 50 percent of morbidity is related to neonatal scours.

Death loss goals should be less than 5% from birth to weaning and less than 2% from weaning to freshening. Another goal is to have a heifer freshen by 24 months of age. Through proper feeding, management and health practices, these goals can be

attained. The annual economic loss of higher than necessary death losses and older than necessary heifers at calving can be staggering.

Raising healthy calves is a challenging job as dairies try to minimize death and disease losses and raise quality replacements for the herd. According to the 2007 USDA NAHMS Dairy Survey, during 2006, 7.8 percent of preweaned heifers (as a percentage of heifers born during 2006 and alive at 48 hours) and 1.8 percent of weaned heifers died (weaning age to calving). Scours, diarrhea, or other digestive problems accounted for the majority of preweaned heifer deaths (56.6%). Respiratory disease was the single largest cause of weaned heifer deaths (46.5%). Management factors do influence the illness and death rates of calves. However, producers do not have to accept high rates as routine. Preventing disease in newborn calves gets them off to a good start, reduces death losses, and is cheaper than treating sick animals. The two diseases that cause the greatest morbidity and mortality in young calves are Scours and Pneumonia. These diseases can have lifelong impacts particularly respiratory disease. Even if a calf survives a disease or sickness, what is its potential for reaching proper weight at the proper time for calving and being successful in the dairy herd? There is no single best way to raise calves, as all sorts of combinations of feeding, housing and management can be successful in the right hands and on the right farm. A system that works well on one farm may fail on another. A calf raising management plan must include all factors which are interrelated, such as nutrition, health care, growth, labor efficiency, capital and operation and maintenance costs. However, thrifty calves cannot be raised efficiently in poor facilities with inadequate animal husbandry. By understanding the scientific principles of calf growth, nutrition, health and behavior, producers can develop a management system that is successful on their own farm. Therefore, the only solution to address calf raising problems is for producers to review the “fundamentals” of calf management. The following are important considerations for that evaluation. They can be applied to every calf raising situation on every farm, whatever size operation.

- ✓ Consistency: There should be consistency of newborn protocol and daily calf management, no matter who is the calf caretaker on a particular day. Work from youngest to oldest animals when doing chores.
- ✓ Vaccination program: It should be periodically evaluated as producers should not depend on vaccination alone to solve disease problems.
- ✓ Water: There needs to be fresh, clean water easily accessible and available at least twice daily.
- ✓ Control flies: Keep ventilation inlets and windows screened at all times for an enclosed facility.
- ✓ Biosecurity: Control and monitor all livestock, equipment, and people entering the calf facility.
- ✓ Colostrum: Protocols should include manual feeding of high quality colostrum to each calf as soon as possible.
- ✓ Calving Area: The use of individual maternity stalls and regular removal of bedding between calvings helps to decrease the incidence of calf diarrhea.

- ✓ Calf temperature: Regular use of a rectal thermometer helps detect sick calves with fevers early. Normal body temperature is 101.5°F.
- ✓ Designated Worker: Calf management work should be handled by the same person(s) every day to limit the possible transmission of disease from calf to calf and from other animals to calves.
- ✓ Calf stress: Changes in routine will stress calves; and animals that are stressed are more likely to get sick. Feed changes, housing changes, and crowding can impose severe stress on individual calves and can contribute to digestive upsets and scours. Management techniques such as ear tagging, dehorning, transporting or the improper handling of calves by caretakers will cause stress.
- ✓ Isolation: Ideally, calves need to be separated from each other with no physical contact between them especially on farms where high rates of contagious disease is present such as Salmonella Dublin, Mycoplasma or Coronavirus. When group housing is used for calves, intensified attention to early identification of sick calves and to environmental management needs to be implemented. Isolate sick and diseased calves, feeding them last. Isolation allows for individual observation of animals in the crucial pre-weaning stage of development.
- ✓ Maternity pens. New bedding should be used for every calving. The calf needs to be removed from the cow, manure and urine immediately.
- ✓ Infection sources. Be on the lookout for the infection sources. Usually the source of infection is feces and nasal discharge. Occasionally, water, feeding utensils, rodents, birds, pets, or people can be the source of infection for calves.
- ✓ Minimize feed and water spillage: Use buckets that are sufficiently large to minimize feed spillage. Place buckets at the proper height to minimize wastage. This helps control flies as well.
- ✓ Nutrition: During the preweaning period, calves are usually consuming a very high-quality liquid diet. Problems can arise when quality standards are overlooked in the grain and forage portion of the diet during that time. Good nutrition can also be easily neglected between weaning and 6 months of age. Research shows that the consequences of improper nutrition during these critical stages of growth can cause these animals to have, on average, a 4½-month delay in age at first calving, a reduction in growth rate, and they are at increased risk of being culled as a cow,
- ✓ Work with your local Vet: Seek advice from your local veterinarian in planning your disease prevention and treatment program.

The NYSCHAP Calf Care Module will help the producer and their herd veterinarian work through the many facets of Calf Care when they work through the Risk Assessments which cover a farm's management, facilities, goals, current morbidity and mortality losses and concerns. There are three Risk Assessment worksheets – 1) A Base Risk Assessment which covers general areas of health and management such as Maternity Pen management, Colostrum Management, Calf Procedures, Calf Housing, Calf Feeding, and Calf Weaning. 2) A Respiratory Risk Assessment which is specific to

respiratory issues in calves. And the 3) An Enteritis Risk Assessment which is specific to diarrhea/scours issues in calves. By asking detailed questions on what is happening on the farm, the producer and their veterinarian can determine high risk practices which may be leading to calf illness, poor growth, or even death in their calves.

Along with the Risk Assessment Worksheets, there are several Appendices that contain useful information to explain the questions asked in the worksheets. These are referenced by section in the worksheets and can be used as references for general accepted practices and industry standards.

This module works with the Core Program of NYSCHAP by performing risk assessments on the farm with a team consisting of the producer, herd veterinarian, NYSCHAP veterinarian and any key people that are deemed important. Goals are established and areas of concern are identified. Intervention tactics are added to the herd plan to address realistic changes for that farm to address those areas of concern. The herd plan is then revisited and updated on an annual basis to show progress or changing tactics or concerns for the farm.

EXAMPLE OF COMPLETED ENTERITIS WORKSHEET

Example Dairy:

- Milking 1,000 cows. Raise all replacements
- Use well-spaced hutches in 4 rows placed on gravel.
- 50-60 wet calves average any one time
- Weaned by 8 weeks of age
- Labor is 1 Hispanic employee and a calf barn/heifer manager. They feed, bed, clean and medicate wet calves. Manager oversees treatments and health assessments
- As of Sept. 2013 using an HTST continuous flow pasteurizer.
- Milk is delivered to calves in plastic tank on back of ATV.
- A small pump moves milk through hose and nozzle to calf pails.
- Calves are fed 2.5 qts 2X/day for first week and then 3 qts 2X until tapered off at week 7.
- Previously calves were fed a 22:20 milk replacer 2X daily.
- Calf pails doubled for milk replacer and water, dumped 2X/day and scrubbed 1X/week.

Disease Issue:

- A common, mild, transient scours changed to a more severe type with death loss in December 2013.
- Disappointing response to electrolytes, fluids and antibiotics has been seen.
- MOS was added to the milk for calves for the first two weeks.

Feeding Management

In hutches

- Have you used the NYSCHAP Calf Base Assessment? *Yes*
- What age order are calves fed? *By location, not age necessarily*
- Do calves have dedicated buckets? *Yes*
- List protocol for cleaning buckets? *Rinse, hot wash, sanitize 1X/week*
- Are surfaces contacting milk inspected daily? *No*
- Are antibiotics : Formulated in milk replacer? *No*
- Added to liquid feed?
- Fed by hand?
- Are antibiotics used prophylactically by other route? *No*
- Do you stop feeding milk when scours occur? *No*
- If yes, for how long?
- What do you do if not have enough milk (whole, waste, pasteurized) to feed to calves? *Supplement w/ milk replacer to older calves*

Personnel Management

- Are there written treatment protocols? *Drug Use Book*
- What are the criteria to begin treatment? *Scouring, slow to drink*
- How often are the calves looked at for signs of enteritis? *2X at feeding*
- What signs are they looking for? *Loose manure, not excited to eat*
- Does the same person choose treatment & assess response? *No*
- How often does someone other than the feeder (manager, owner, vet) look at calves for signs of enteritis? *Manager when asked or working with calves and the vet after herd check*

Outbreak Investigation

- How long has the outbreak been going on? *2 months*
- What is the range of age of affected animals? *7-12 days*
- What signs have been identified (fever, dehydration, lethargy, neurologic signs)?
Fever, dehydrations, lethargy
- What is the severity of diarrhea? *Moderate to severe*
- Is there any bloody diarrhea? *Occasionally*
- What is the duration of illness in calves that die? *2-7 days*
- Morbidity Rate? *60%* What percent of affected calves die? *20%*
- Have new animals been introduced to the farm? *No*
- Do dogs & cats have access to calf facilities? *Cats*
- What has changed prior to onset of the outbreak? Pasteurizer installed 5 months ago in September, changed from milk replacer*
- Has failure of passive transfer been assessed? *Spot checks*
- Are records kept of severity & treatments by calf? *Written in notebook*
- Are there records of DOB, dystocia level & colostrum feeding? *Yes*

Is occurrence associated with a specific: time frame(day/time)/personnel feeding colostrum/personnel mixing and feeding liquid feed? *No*

Diagnostics of Liquid Feed

Have cultures been performed on as-fed liquid feed? *Yes* If yes, at what point?
Right after preparation/ before first calf is fed/ after last calf is fed

How often are cultures performed on: *Started 3 weeks ago*

As fed liquid feed right after preparation?

As fed liquid feed before first calf is fed? *3X*

As fed liquid feed after last calf is fed?

Have you cultured colostrum? *Yes*

Cultures on rinse samples from articles used in feeding? *No*

Cultures on environment (maternity pen, newborn holding areas, calf conveyance, housing)? *Yes; maternity pen*

Pasteurizer

Does your hot water source match the pasteurizer demand? *Yes??*

Is milk stored prior to pasteurizing? *Yes; old bulk tank*

If yes, how long and at what temperature? *Less than 1 day at 38 F*

Is milk stored after pasteurizing and cooled to 110-120°F? *No; fed next feeding*

If yes, how long and at what temperature?

How quickly is milk fed after pasteurizing? *1-3 hours*

Diagnostics

Have necropsies been performed? *Yes* If yes, results: *Lungs good, stomach okay, no fat, enlarged intestinal lymph nodes, inflamed small intestine*

Any Salmonella testing on the herd been done? *Yes* If yes, results: *Fresh cow fecals and colostrum positive*

Have there been any laboratory tests performed including antibiotic sensitivities?
If yes, results: *Positive Crypto fecals; no positive BVD-PI, k-99 E.coli*

Treatments administered: Include product, route, dose, frequency:

Electrolytes *Re-sorb 2qts 1-2X on 1st day*

Fluids *LRS or isotonic saline, SQ, 1 Liter*

Anti-inflammatories *Banamine, IM, 1-2cc once*

Antibiotics *Naxcel, IM 1cc/100 lbs, 1X/daily if appear septic*

Bio-Mos

Other

See Cornell University NYS Veterinary Diagnostic Laboratory website for detailed information on Diagnostic Plans:

http://ahdc.vet.cornell.edu/docs/Bovine_Diagnostic_Plans_Panels.pdf

What the Assessment Tells Us:

The assessment sheet indicates a severe enteritis problem

- 60% of calves affected
- 20% of those dying
- Mortality rate of 12%.
- Calves are between 7 and 12 days of age when signs appear.
- Death occurs between 2 and 7 days into the illness.
- Calf observations, record keeping, treatment guidelines and feeding protocols appear to be within expectations.
- Diagnostic work has identified Salmonella sp., E. coli and cryptosporidia as culprits.
- Culturing has pointed to the maternity pen and colostrum as sources of Salmonella sp.
- Necropsy findings of enlarged intestinal lymph nodes suggest Salmonella sp. as well.

Below is the Herd Plan created for this farm. The Herd Plan is created to address the most pertinent areas of concern with detailed intervention tactics. This plan will be revisited at least annually to determine progress and update accordingly based on current issues.



NYSCHAP Herd Plan

Farm: Calf Health Module Example

Date:

Intervention Tactic

Pasteurizer Management: Clean after each use, flush with water until water runs clear, use recommended alkali detergent for at least 30 minutes, draining and following with an acid rinse. Perform calibrations on pasteurizer – peak temperatures of 161 F for 15 seconds during treatment. Water temperatures during the cleaning process of 170-180 F. Perform cultures of pasteurized milk – goal of <20,000 cfu. Culture pre-pasteurized milk-if it exceeds 2,000,000 cfu/ml then pasteurization will not be as effective. Refer to Appendix H2 Management of Pasteurized milk in Calf Health Module.
Examine and culture plastic tank, hoses, pump and valves. Looking for pathogens that may be accumulating in system which are not effectively being cleaned and sanitized in these difficult to clean areas.
Review the process of harvesting, handling, delivery and storage of colostrum. Create written protocols for each of these steps with employee training for continuity and quality control. Refer to Appendix C – Colostrum Collection and Handling for detailed steps and goals.
Assess passive immunity by taking serum proteins more often. Use a digital refractometer on serum from calves 24-48 hours after birth. Goal is to have <20% with less than 5.5 TP which indicates failure of passive transfer. If greater than 20% with FPT then need to re-evaluate colostrum management. Refer to Appendix C1 – Testing for Passive Transfer of Immunity in Calf Health Module.
Review physical examinations, diagnosis, treatments, vaccinations and biosecurity. Evaluate if disease is moving from maternity pen, adult animals, or incoming animals to calves. Review vaccination program regularly with herd vet. Review employee training and protocols for calf examinations, and treatment protocols for effectiveness.
Monitor calving pen management for cleanliness. Want to reduce overcrowding, and remove the calves from the pen away from adult cows ASAP. Goal is to minimize adult cow manure exposure to newborn calves.

HOW TO ENROLL IN NYSCHAP

To enroll in NYSCHAP, contact your herd veterinarian. He or she will then make arrangements with the regional field veterinarian from the NYS Department of Agriculture and Markets. For additional information, contact one of the sources below:

- To enroll or contact a state field veterinarian, call NYS Division of Animal Industry at 518-457-3502 or visit their website at: www.agriculture.ny.gov/AI/AIHome.html
- For diagnostic testing services or information, call the Animal Health Diagnostic Center at Cornell University, 607-253-3900
- For general information and information to enroll, contact the NYSCHAP coordinator, Melanie Hemenway, DVM. Email: Melanie.hemenway@agriculture.ny.gov or call 585-313-7541
- Visit the NYSCHAP website at: <https://ahdc.vet.cornell.edu/sects/NYSCHAP/>