



DAIRY FARM SUSTAINABILITY CHECKSHEET

LIVESTOCK SYSTEMS GUIDE

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Introduction

This checksheet is designed to stimulate critical thinking in planning a farm on which a primary enterprise is milk production. This relates to all dairy species: cattle, goats, and sheep. The sustainability of a farm relates to many factors revolving around farm management, use of resources, and quality of life. The series of questions is intended to stimulate awareness rather than serve as a rating of management practices. Carefully think about how decisions made in one area impact the results in other areas of your farm. Use this guide to define areas in your farm management that might be enhanced, and to identify areas of strength as well.

Suggestions on how to use the checksheet

The checksheet is quite lengthy and can be rather intimidating, to both educator and producer. Having evaluated the use of the checksheet on several farms, the authors make the following suggestions to the educator:

- Send the checksheet to the producer prior to the first meeting.
- Be flexible. The producer and the educator should be comfortable in working through the process. Remember that the checksheet is a guide to assess the operation.
- Review the questions beforehand. Then, when going through them with the producer, don't just read the questions but address them in your own words. If a question has been addressed in general conversation, or if a question doesn't need to be answered because of the way a previous question was answered, move on to the next question. If the producer doesn't have a problem in a certain area, then the subset of questions pertaining to that problem need not be addressed.
- There are no right or wrong answers. The producer should not be able to answer all questions and may need more information in order to answer some questions.
- Having aerial photos, soil maps and topographic maps on hand during the assessment has proven useful.
- Since the time needed to completely work through the checksheet may be longer than is available for a single farm visit, two or more visits may be in order. The checksheet is most useful in making the producer aware of management alternatives. Therefore, defining the items for which he or she needs more information is most important. The producer should use the sections that apply.

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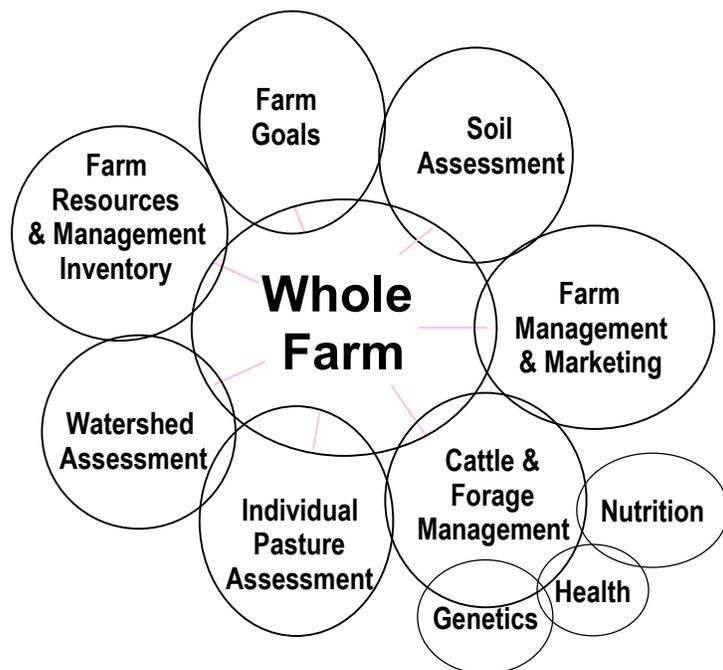


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INVENTORY OF FARM RESOURCES AND MANAGEMENT

Size of farm (owned) _____ Acreage rented _____
Acres of: Pasture _____ Woods _____ Crops _____
Number of: Milking animals _____ Replacements _____ Dry animals _____
Other types of animal and farm enterprises _____

Breeds _____ Weight of mature animals _____
Number of: pastures on farm _____ ponds _____ other water sources _____
Do you have city water? _____ Developed wells? _____ Flowing water? _____

Market for milk _____

Months you calve (kid, lamb) in _____ Milk in _____

How many acres of the following do you have? What is grown?
predominantly cool season perennial grasses _____
predominantly warm season perennial grasses _____
mixture of warm and cool season grasses _____ pastures with legumes _____
cool season annuals _____ warm season annuals _____
pastures that can be stockpiled for late fall/winter grazing _____
crops for silage _____ for grain _____ alfalfa _____
do you use crop aftermath? _____

Which practices are part of your grazing system? short duration, slow rotation, continuous grazing

Do you feed TMR? _____

What kind of housing facilities do you use? _____

What is your nutrient management system? _____

Give major soil types and productivity indexes for the farm _____

When and with what do you fertilize? _____

What are the top five strengths of your operation? _____

What are the top five problems? _____

Instructions: In the margin for each question, place a checkmark if it needs further thought. Leaving the item blank indicates that the area covered in that question is not a problem or an issue in the management program. Keep in mind that some questions are repeated to show interrelationships.

SUSTAINABILITY

- _____ Does having a greater gross income translate into more net income? _____
- _____ Are you doing things to improve the quality of life for you and your family? _____
- _____ Do you have a plan to graze more and feed less? _____
- _____ Do you have a plan that will allow you to use off-farm inputs in your operation? _____
- _____ Are you improving your soil or just maintaining a level of fertility? _____
- _____ Do you recognize the interactions occurring on your farm, i.e. how one decision affects another? (give an example) _____

I. FARM PLANNING AND GOALS

Farm planning is an on-going process that requires farm families to know where they want to go and how to get there. In determining goals, most farmers have a general idea but lack specifics. Putting goals on paper can provide a framework for making management decisions. Once you have written down your goals, other decisions are easier. You can plan for farm expenditures rather than buying what seems to be needed at the time.

- _____ Do you have written goals for your farm and family? If so, list them below.

- _____ What are your short-term production goals? _____
- _____ What are your long-term production goals? _____
- _____ What do you want your operation to be in five years? _____
- _____ 10 years? _____
- _____ 20 years? _____
- _____ Are you thinking of expanding your dairy operation? _____
- _____ Do you have plans for when milk prices are high? _____ When they are low? _____
- _____ What do you measure in terms of milk production parameters? _____
- _____ Do you know your cost of producing 100 # of milk? _____
- _____ What is your income goal? _____
- _____ Does your enterprise income support your quality of life goals? _____
- _____ What do you wish were available to you in the way of services or information? _____

- As you consider the goals of your farming operation, are you
- _____ examining your dairy production program to make it more cost effective? _____
 - _____ assessing the soil, plant, and water resources? _____
 - _____ analyzing your marketing program and the potential to change it? _____
 - _____ evaluating your quality of life from a family and community perspective? _____

- _____ How do you see your quality of life changing within 5 years? 10 years? 20 years?

- _____ How do you decide your priorities for expenditures on the farm with a given amount of money?
 equipment _____
 feed _____
 pasture—establishment or renovation _____
 fertilizer _____
 fencing _____
 animals _____
 labor _____
 quality of life _____
- _____ Do you know your return on investment for those expenditures? _____
- _____ Do they increase your quality of life? _____
- _____ Is the farm income distributed over the year? Are there things you can do to spread out income?

- _____ Can you continue to do what you are currently doing for five years? _____

II. FARM MANAGEMENT

A. Records

The decision-making process needs to include a standard analysis of farm records to evaluate production and to determine if and how production might be increased economically. Many times decisions are based on recommendations to increase the biological efficiency of an operation, e.g., increasing milk production, without any thought given to the economic efficiency. Actual costs of production should be calculated for each farm, as cost averages from other operations may be quite different from your own farm's costs.

- What are your farm management goals? _____
- _____ Do you make good use of a record-keeping system? _____
- _____ Are you on DHI or other testing program? _____ If so, which one? _____
- _____ Do you know your actual cost of production per acre? _____ per animal? _____
- _____ Do you evaluate production based on per acre or per animal costs when making decisions?

- _____ How many pounds of milk do you sell per acre? _____ per animal? _____
 per worker? _____

Hay and silage are major expenses for many livestock operations. Usually grass is considered cheap, but harvesting costs are quite variable, depending on land values, fertility costs, labor, and availability of equipment. Before a producer makes decisions related to producing or buying hay, using more pasture (annuals) or feeding hay a longer period, these costs should be calculated.

- _____ Do you know what it costs to produce, harvest, and feed a ton of harvested feedstuffs? _____
 graze an acre of pasture? _____ graze one cow for one day? _____
- _____ Can you purchase harvested feedstuffs cheaper than you can produce them? _____
- _____ Would purchasing free up more pasture for grazing and cut your costs of production?
 _____ If contracting your harvesting, what if the harvesting is not done on time? _____

B. Farm planning

- _____ Would diversification with other animal species add some benefit or add extra income? _____
 - _____ Would adding other species to your grazing program better utilize the forage? _____
 - _____ If so, what are the considerations? (e.g., labor, predation, fencing, market, hunting) _____
-

Fertilization of pastures can be a great expense for cattle producers. A rotational grazing program helps to minimize these costs, as well as waste management costs, by having the manure from the grazing animals distributed back on pastures rather than in isolated areas, such as around shade trees, water tanks, etc. An important but often overlooked component of a good pasture fertility program is level of organic matter, which influences the microbial activity of the soil. Using dairy waste is an opportunity to increase organic matter and nutrient content of soils that would most benefit.

- _____ Are you testing soils in each pasture or field at least every three years? _____
- _____ Are you making effective use of your fertilizer expenditures? _____
- _____ Are you using the additional forage you produce with purchased inputs? _____
- _____ Could you decrease N fertilizer through more effective use of legumes? _____
- _____ Would using lime allow a decrease in fertilizer expenditures? _____

Equipment expenditures on a farm can be very costly, yet also be part of the tax consideration, which has an impact on purchasing decisions. Proper sizing of equipment to the job and minimizing equipment maintenance and operational costs are also important. In some cases, hay can be purchased or custom baling used to decrease farm costs. Some producers make equipment purchases for non-economic reasons and have equipment that cannot be justified based on economic return to the farm.

- _____ Do you own more equipment than you need? _____
- _____ Could you decrease the equipment you need if you relied more on grazing? _____
- _____ Do you buy equipment for tax reasons, even though you don't need the equipment? _____
- _____ Does that equipment expenditure for tax reasons really increase your net income? _____

Feed expenses are usually considered the primary costs of a dairy. Having to purchase supplemental feeds and using harvested forages can increase the expenses of a dairy operation. As referenced earlier, good grazing management can decrease those out-of-pocket expenses. Conversely, there are times when supplements can be used very effectively and buying harvested feedstuffs might be more economical than producing them on the farm.

- _____ What are your primary purchased feed expenditures? protein, energy, minerals, forages
- _____ Could you decrease these by
 - _____ using by-product feeds? _____
 - _____ harvesting better quality feedstuffs? _____
 - _____ improving fertility of your pastures? _____
 - _____ better grazing management to be more efficient in pasture utilization? _____
 - _____ having better or more diverse forage species to extend the grazing season? _____
 - _____ changing the time of year when nutrition requirements of animals are highest? _____
- _____ How do you know which of the purchased feeds you actually need? _____

III. FACILITIES

A. Livestock housing

- _____ Are you satisfied with your livestock housing facilities? _____
- _____ If not, what are the problems? _____
- _____ How many animals will your barns hold? _____ How many do you have in them? _____
- _____ Could you move animals out of barn? _____
- _____ Do you have windbreaks in pastures? _____
- _____ Do you have shade? _____
- _____ Is there water available? _____
- _____ Do you have adequate loafing areas? _____
- _____ Are the animals comfortable while in these areas? _____
- _____ Do you have respiratory problems in your animals? _____
- _____ How are your barns ventilated? _____
- _____ What percentage of cows use their free stalls properly? _____
- _____ Do your cows lay down and chew their cud? _____ Where do they rest? _____
- _____ Is the bedding dry? _____
- _____ Do cows appear stressed during weather extremes? _____
- _____ Where do your cows drink? _____
- _____ Do you have enough water for all of them to drink? _____
- _____ Is the location of your barn such that runoff creates an environmental problem? _____

B. Milking parlor

- _____ Are you satisfied with your milking facilities? _____
- _____ How calm are your cows while being milked? _____
- _____ How long are they in the milking parlor? _____
- _____ Do you feed in the milking parlor? _____
- _____ Do you have problems with stray voltage? _____
- _____ Is your equipment adequately grounded? _____
- _____ Do you have your milking equipment tested regularly? _____

C. Calf raising

- _____ Do you raise your own replacement heifers? _____
- _____ How do you raise them? _____
- _____ What is your disease incidence? _____
- _____ What do you feed them? _____

D. Other

- _____ Do you have separate storage area for chemicals? _____
- _____ Do you have feed storage facilities available? _____
- _____ Are they adequate for commodities or for good buys? _____

IV. LIVESTOCK and FORAGE PROGRAM

A. Herd health and reproductive management

Well-nourished, stress-free animals are the foundation of a sustainable livestock program. This means animals are healthy and perform better, are easier to manage and care for, and can more easily handle adverse conditions. While seemingly a simple question, this is intended to stimulate quick evaluation of any stress the animals may have. Simply walk into your herd and take a look at your animals.

- _____ What is the overall appearance of your animals? _____
- _____ Do your animals appear to be thrifty, contented, and performing to your satisfaction? _____
- _____ What is your animals' comfort level? _____
- _____ If your animals are housed in a barn,
 - _____ what kind of bedding do you use? _____
 - _____ Is it dry? _____
 - _____ How often are stalls cleaned? _____
 - _____ Do cows stand for more than four hours at a time? _____
- _____ Are feeders and waterers clean? _____

A good health and reproductive management program will allow a producer to avoid problems. Most reproductive management problems involve poor nutrition. The forage management plan, by ensuring an adequate supply of high quality forage throughout the year, will reduce the incidence of health and reproductive problems in the herd. If fed properly, cows will cycle and breed early after calving, preventing problems with open cows or late-calving cows.

While most people strive to have cows in condition score 3.5 for heifers and 3.75–4.0 for cows (1–5 scale) at calving, the critical point is to have cows maintaining weight before breeding, especially if seasonal. Sheep and goats do not have as much problem maintaining body condition since both are seasonal breeders. Does need to be in a similar body condition as cows, although they will be about two-thirds of the way through their lactation when they are bred. Ewes, not being milked more than ten weeks, should be in good body condition at breeding.

- _____ Do you have a regularly scheduled herd health check with your veterinarian? _____
- _____ What vaccinations do you give? _____
- _____ Do you use rBST? _____
- _____ When, how often and on what basis do you deworm? _____
- _____ What is your calving interval? _____
- _____ What is the body condition scores of your animals?
 - _____ At beginning of dry period? _____
 - _____ At parturition? _____

Mastitis is an infection that every dairy must constantly be vigilant against. It can be very expensive, both in terms of lost milk production and in treatment costs. However, if steps are implemented and carefully followed, it does not have to be a common occurrence. Farmers whose animals spend the majority of time outside on pasture find their incidence of mastitis decreases by that one thing alone. The environmental pathogens are no longer able to survive and infect the udder. Contagious pathogens are best guarded against by making sure milking procedures are managed correctly, as this is where

most infections occur. Somatic cell counts are the best indication of potential mastitis problems. While bulk tank samples, if done often enough, provide some indication of level of mastitis, testing each animal will identify those animals with elevated counts and help determine the best management strategy.

_____ List the steps in your milking procedure. _____
 _____ What is the somatic cell count for each milking animal? _____
 _____ What is your average number of lactations? _____
 _____ What percentage of animals have mastitis? _____
 Is it:
 Staph aureus? _____ Strep? _____
 Environmental? _____ Do you know? _____

_____ In what order do you milk your animals? _____
 _____ What do your cows do after being milked? _____
 _____ Where do animals lie? _____
 _____ How is milking equipment cleaned? _____

Do you have a problem with
 acidosis? _____ displaced abomasums? _____
 dystocia? _____ detained placentas? _____
 internal/external parasites? _____ milk fever? _____
 pregnancy toxemia? _____ feet? _____
 legs? _____ What percentage of your cattle have problems with their legs? _____
 To what degree do they have a problem? _____
 How often do you trim feet? _____
 bovine leukosis? _____ Johne's? _____
 caprine Arthritis Encephalitis? _____ other chronic diseases? _____

Stress can be additive, in that one stressor alone may not be a problem, but when multiple stresses occur animals perform poorly or get sick. For example, parasites may not be a problem in well-nourished animals but cause problems when animals are under nutritional stress. Stress to animals can be decreased by careful design of facilities, proper consideration of animal behavior, adequate nutrition and awareness that drastic changes in diet can stress animals. Behavior of animals can cause stress to both handler and animal. The comfort zone of cattle is 30-75 degrees (effective temperature including wind chill). Outside of that temperature range, cattle have to expend energy to keep warm or cool. When temperatures exceed 75 degrees, cows will eat 3.4% less feed for every 2-degree rise in temperature. Above 80 degrees and 60% humidity, milking cows will begin to feel heat stress.

_____ Are animals stressed
 _____ during milking? _____ during weather extremes? _____
 _____ do you have wind breaks in winter? _____
 _____ do you have shade? _____ sprinklers? _____
 _____ do you use techniques that minimize stress? _____
 _____ are animals on slick concrete? _____ in deep mud? _____

- _____ is dry matter intake/forage availability high enough to meet animals' needs to prevent sickness at high stress times? _____
- _____ what are the condition scores of animals which show stress? _____
- _____ is there good quality and adequate quantity of water during hot weather? _____

B. Breeding, genetics, and selection program

Breed selection should be based on the actual merits of a particular breed for a specific marketing program (milk, cheese, etc.) or forage utilization program. Consideration of animal type and of the kind of environment or management the seedstock were produced in helps predict how they will perform in another person's program. For example, cattle from one geographical region may not perform well in another, or cattle developed in a confinement setting may not perform well on a pasture program.

- _____ What are the goals for your breeding program? _____
- _____ What traits do you want to improve? _____
- _____ What breeds do you use? _____
- _____ Why did you choose those breeds? _____
- _____ Are there breeds that would better fit your present or potential marketing program? _____
- _____ Are there breeds or breeding stock which would better fit your forage or management? _____
- _____ Is your calving interval consistent with your production goals? _____
- _____ Are you seasonal? _____
- _____ Are you using rBST and stretching out the calving season? _____
- _____ Do your goats or sheep breed early in their breeding season? _____
- _____ Do you breed out of season? _____
- _____ On what basis do you choose a sire? _____
- _____ What percentage of breeding is AI? _____
- _____ Do you choose a sire to improve weaknesses, such as change frame or body type? _____
- _____ Do you choose an easy calving sire for heifers? _____
- _____ Do the majority of your cows calve when your pastures can supply the most forage? _____
- _____ Did your animals come from a grazing operation? _____
- _____ Do you select for grazing behavior? _____
- _____ Do you select animals that have been raised in a management/environment similar to yours? _____
- _____ Do your animals have good feet and legs? _____ Udders? _____
- _____ What percentage of twins are born? _____
- _____ Do you have a high percentage of heifers become pregnant during breeding? _____
- _____ Do you raise your own replacement females? _____
- _____ If so, could you purchase them more economically? _____
- _____ Could you contract with someone else to raise them? _____
- _____ What is your culling rate? _____
- _____ On what basis do you cull? _____
- _____ Is your nutritional level adequate to meet the animal's needs? _____
- _____ Is your animals' intake as high as it needs to be? _____

C. Nutrition management

Feeding system and choice of forages are the key components of a dairy nutrition program. Regardless of how animals are raised, the quality of the forages fed, whether grazed or harvested, is the most important nutritional component to consider. Many dairies are grass-based, but many of those could utilize their pastures better by implementing a grazing management plan. We Americans have tended to not use pasture, opting to feed TMR or harvested forages that in some cases drastically increase the cost of production. All aspects of grazing, including when and for how long animals graze, change the pasture by affecting plant species diversity, plant population, and plant density. In a sustainable system, these changes should improve the pasture's ability to meet the nutritional needs of the animals, minimizing the need for harvested forages and purchased feeds. Dairy producers in other parts of the world avoid the prohibitive costs of harvesting forages (equipment needs, fertilizer costs, fuel use, etc.) by using management techniques that more efficiently utilize pasture. Some dairy producers consider seasonal dairying where they can impact the animal's needs by changing the time of the greatest nutrient requirement, peak lactation, by timing when the animal calves and matching the forage production to the lactation curve.

Because protein levels are so important, milk urea nitrogen (MUN) tests have been developed to give a measurement of the amount of nitrogen being excreted through the milk. Some people check blood urea nitrogen (BUN) levels, which while more accurate, are not as easy to collect as MUN samples. MUN levels are used primarily to determine if the feeding program is balanced for protein content, including degradable and undegradable protein. Normal levels are 12-18 but individual herds sometimes vary from these levels. Too low protein or MUN levels can cause lower milk production and too high levels can lower reproduction and increase feed costs. Low levels may occur most often in herds using harvested forages where quality was not adequate, whereas high levels may occur on pasture where protein is actually too high with a very high percentage of soluble protein. In the case of high soluble protein, energy is usually lacking, necessitating supplemental feeding on what is thought to be high quality pasture.

- _____ Are the crude protein levels of your total ration 18-19%? _____
- _____ Is the degradable intake protein (DIP) in the 60-65% range? _____
- _____ Is the undegradable protein or bypass protein in the 35-40% range? _____
- _____ Do you understand the function of the different protein fractions? _____
- _____ Do you test for MUN? _____ If so, are the levels between 12-18mg percent? _____

Fiber keeps the mechanics of the rumen functioning well. The rumen must function well in order for the milking animal to remain healthy and produce an optimal amount of milk. Neutral detergent fiber (NDF) levels are used to determine intake and acid detergent fiber (ADF) levels are used to determine the digestibility of a feed. The best indication of fiber level is amount of time a ruminant chews her cud.

- _____ What percent body weight do milking animals eat in forage dry matter? _____
- _____ Is the NDF level in the diet at least 28%? _____
- _____ Is the ADF level at least 19%? _____
- _____ How much time do milking animals spend chewing their cud? _____
 - _____ If feeding silage or TMR, are the lengths of plant material sufficient? _____
 - _____ Do animals lie down while chewing their cud and appear comfortable? _____

_____ Are you feeding a buffer, such as sodium bicarbonate? _____

Energy is the other major component besides protein that must be adequately provided. The rumen microorganisms require energy to break down the plant material fed, in addition to the amount of energy the animal herself needs. Larger breeds of cow, such as Holsteins, should be fed one pound of grain for every four pounds of milk. Smaller cows, such as Jerseys, will need about one pound of grain for every three pounds of milk. Does and ewes should be fed one pound of grain for every two pounds of milk. Feeding too much grain at one time will lower pH of the rumen, causing acidosis. Adding a buffer to the ration, such as sodium bicarbonate, will help to prevent acidosis. Grain intake should not exceed 60% of the ration DM. All animals require fat in their diets, which is available in the forages and grains. High producing dairy cows and some does, however, cannot eat enough energy-containing feeds to avoid losing body condition and need an additional fat source. It is best if this fat is provided in the form of whole cottonseed or roasted whole soybeans, although 2% can be added from a ruminally inert source, as rumen bacteria do not function well if there is too much fat in the diet.

It is important to decrease energy levels in cows as the lactation period progresses and into the dry period, so as not to overcondition the cows.

D. Pastures

These questions are for those times of the year when pastures are being grazed.

The use of pasture is being considered by many dairy farmers in order to decrease their milk production costs and increase the economic and environmental sustainability of their farm. Central to the choice to be grass-based are several questions that need to be addressed. Under continuous grazing, as the season progresses, grazing becomes spotty, as some areas within a pasture are overgrazed and others are undergrazed. Some plants mature and quality decreases while other plants do not persist because of depleted root reserves. Consequently, milk production declines because of poor availability of quality forage and subsequent decreased intake by the grazing animal. Controlled grazing allows pastures to be grazed sooner in the spring and later in the fall, with an availability of forage that allows high animal intake and at the same time gives other pastures the opportunity to grow and rest. By knowing what forage is produced, when and how, we can feed our animals on good pasture for a longer period of time. We can change the forage production curve through management. Dairy producers should consider moving milking animals every twelve hours to fresh pasture. Pasture that is too vegetative will be too high in degradable protein without adequate digestible fiber. Therefore, dairy producers can use grain supplementation effectively to balance the nutritional requirements of their milking animals on pasture.

_____ Do you have a rotational grazing program? _____

_____ Are you considering grazing your animals more? _____ less? _____ same? _____

_____ Do you have the acreage necessary to be pasture-based? _____

_____ Are you an experienced grazer? _____

_____ If you are interested in becoming more grass-based, what do you have to do in order to do so? _____

_____ How many days during the year can you graze? _____

_____ When during the year can you graze? _____

_____ How many days could you graze with a better plan? _____

_____ When during the year do you need more pasture? _____

- _____ Is pasture quality or pasture availability a bigger problem for you? _____
- _____ What are the options you have to increase forage availability? _____
- _____ What are the options you have to increase forage quality? _____
- _____ Is your farm soil type/base fertility conducive to being grass-based? _____
- _____ Do you have a soil map of your farm and have forages that perform well on those soil types? _____
- _____ Which options are realistic considerations for you?
 - _____ More annuals _____
 - _____ More emphasis on legumes _____
 - _____ Complete pasture renovation _____
- _____ Do you have a drought plan? _____
- _____ Is irrigation an option for you to consider to grow more forage? _____
- _____ Do you cut pastures for silage or hay in order to keep pasture growth under control? _____

E. Confinement

These questions are for during those times when animals are being confined

Many dairies, even ones that are grass-based during the warmer months of the year, have cows in confinement at certain times of the year. Others have animals confined the majority of the time. Some of these dairies are discovering that allowing cows outside of the barn for three hours a day is eliminating certain problems. Comfort of animals in confinement is an important issue to be aware of. Feeding is another area that a farmer must have knowledge of in order to avoid digestive, breeding and other associated problems, especially in high producing animals.

Cattle in confinement have their environment controlled by the farmer. In order for the animals to produce to their potential and for the farm to sustain itself, nutrition along with comfort has to be optimal. Cows should be fed to consume 4% of their body weight at peak lactation and should reach that level by ten weeks after calving. Protein and energy levels must be in balance. Protein levels must not be too high to avoid acidosis and to prevent nitrogen levels in the urine from being too high which can be an environmental problem. Cows will drink a half gallon of water for every pound of milk produced.

- _____ How many pounds on a dry matter basis do you feed your milking cows? _____
- _____ Do you have fresh feed available after every milking? _____
- _____ Do you allow your first fresheners enough time to eat? _____
- _____ Do you feed them separately from your older milkers? _____
- _____ Where do you feed your milking herd? _____
- _____ How many times a day are they fed? _____
- _____ Is there enough bunk space for each animal? _____
- _____ Are cows milking what they should be milking? _____
- _____ What is the protein level of the feed? _____
- _____ What is the energy level of the feed? _____
- _____ Do you raise your milking animals in confinement but raise your heifers on grass? _____

F. Harvested forages

General

- _____ Do you utilize harvested forages in your dairy operation? If so, which ones? _____
- _____ Where are these forages obtained?
- _____ grown on farm _____
 - _____ purchased locally _____
 - _____ purchased from other areas of state or country _____
- _____ If forages are harvested on your farm, which of the following are major justifications for this practice?
- _____ control excessive spring growth in pastures _____
 - _____ extra hay or silage for cash crop _____
 - _____ provide all or significant portions of the forage for your dairy herd and replacements _____
 - _____ maintain appearance of farm and/or weed control _____
 - _____ other _____
- _____ How are your harvested forages delivered to your livestock? _____
- _____ all are fed directly in bunks, hay rings, etc. (no blending with other ingredients) _____
 - _____ all forages are fed as part of a TMR (total mixed or blended ration) _____
 - _____ modified TMR - a significant portion of the forage consumed is delivered with concentrates via TMR, but the balance is supplied either by supplemental grazing or by directly feeding harvested forages elsewhere _____
 - _____ combination of these approaches (please describe) _____

Ideally, forages should be harvested at the boot stage or beginning bud stage, but your goals will also determine when it is best for you to harvest. For instance, if top quality is not necessary, alfalfa should be harvested at at least 1/10 bloom to promote positive growth reserve balance and persistence. Cereal grains probably should be harvested at boot stage, but most of these (excepting cereal rye) also get a quality bump during grain fill. It may be advantageous in some cases to wait until soft-dough stage. The weather may be better then and you could direct cut because the moisture content is lower. Many crops tend to be drier and dry faster as they mature; if top quality is not needed, you may want to take advantage of this. Also, there are various ways to manage mixtures, which can easily vary depending on your goals. The point is not so much that there is a right and wrong way to manage things (although there are certainly absolutes), but that you should be encouraged to think through a reason for what you do.

- _____ What plant growth stage (maturity) do you target for harvest?
- _____ cool-season perennials _____
 - _____ warm-season perennials _____
 - _____ cereal grains and ryegrass _____
 - _____ legumes _____
 - _____ corn _____
 - _____ forage sorghum _____
- _____ Which of these numbers that are typically reported on your forage tests do you not understand? Do you understand how these numbers change as plants mature? Do you understand how different forage classes (like those identified in the previous question) vary with respect to these numbers?
- _____ Crude protein _____ NDF _____ ADF _____ TDN _____
- _____ Do you understand the relationship between forage fiber content (NDF) and intake?

Silage

_____ What criteria do you use when selecting a variety for
_____ corn silage? _____
_____ sorghum silage? _____
_____ alfalfa silage? _____

_____ How are your silages stored?
_____ covered pile _____ trench or bunker
_____ upright silo (traditional) _____ upright silo (oxygen limiting)
_____ silage bag _____ balage
_____ other _____

_____ Are bunker or trench silos covered with plastic and sealed? _____
_____ Is this plastic weighted with tires or other weights? _____
_____ Is all runoff water diverted from the silo? _____
_____ Is there evidence that rodents, racoons, or other animals are destroying the plastic and exposing the silage to the air? _____
_____ If silage bags or balage are used, do you place these "silos" in sites that are weed and debris free? _____
_____ Do you practice aggressive control of rodents and other pests? _____
_____ Do you regularly inspect silage plastics for holes and then patch with the appropriate UV-resistant tape? _____
_____ Has some thought been given to diverting runoff water away from these "silos"? _____
_____ Are these "silos" used within the expected life of the plastic? _____

Most dairymen harvest several types of forages and may store them in different types of silos. These factors may affect the proper moisture content for each forage at the time it is ensiled. They also may determine whether the forage can be direct cut or whether it must be wilted prior to chopping or baling for balage.

For each combination of forage and silo type that you utilize, describe the moisture content that you target for proper fermentation, stability, and animal performance _____

_____ Is there evidence of excessive effluent production? _____
_____ Is there evidence of undesirable fermentations? _____
_____ ammonia odor _____ butyric acid odor
_____ acetic acid _____ poor intake and performance

_____ Is the silage excessively dry? _____
_____ Does the silage appear to be moldy? _____
_____ Is there any evidence of heating in the silages being offered to dairy cattle? _____

During feedout, silo management is very important. The following questions apply to the feedout phase specifically.

_____ Is the silo too large for the numbers of cattle being fed? _____
_____ Is some silage removed from the entire exposed silage surface each day in order to keep the exposed silage face or surface fresh? _____

_____ Is there evidence of excessive loose silage in the trench or bunker silo? Does this silage appear to be heating? Does the individual responsible for feeding habitually loosen more silage than necessary, thereby exposing large quantities of unfed silage to the air? _____

_____ Are cattle fed several times per day? Are cattle encouraged to eat during hot weather by using sprinklers, fans, etc? _____

_____ Are feed bunks cleaned regularly? _____

During filling, every effort should be made to fill quickly and pack thoroughly to limit air access to the silage mass. The following questions apply to this phase of silage harvest.

_____ Do you make every possible effort to fill silos rapidly and pack thoroughly? _____

_____ Within trench or bunker silos, are there large fault lines of poor or spoiled silage that would indicate prolonged or multiple exposures to the air during filling? _____

_____ If more than one crop is ensiled, are additional silos available to maximize flexibility and prevent the necessity of opening sealed silos to accommodate additional crops? _____

_____ Is it necessary for you to feed unfermented corn silage at any time during the fall? _____

_____ If you rely on a custom harvester in the silage making process, are you satisfied with the reliability of this individual? _____

_____ Is service provided within a reasonable window of time? _____

_____ If the answer to either of these questions is no, can you estimate what this frustration costs you in excessively mature forage, additional grain costs, and lost milk production? _____

_____ Does this cost warrant changing the custom harvester, buying silage-harvesting equipment, or relying exclusively on hay and/or grazed forages? _____

_____ If you harvest your silages yourself, what are your biggest impediments to rapid filling?

_____ capacity of chopper is too low _____ labor

_____ transport of chopped forage to silo by wagon or truck

_____ unloading silage at silo _____ packing

_____ sealing _____ other _____

_____ Can these inefficiencies be improved in an economical manner? _____

_____ Have you considered using silage inoculants on high-risk crops, such as alfalfa? _____

Hay

_____ Do you use a plunger-type baler to harvest legumes? _____

_____ Do you rake legumes at moisture contents > 40% ? _____

_____ Do you avoid baling excessively dry legumes, which results in elevated leaf loss? _____

Realistically, is it feasible to expect to bale dairy-quality hay in the spring in your area? Can other livestock classes utilize rained-on hay ? Should you consider balage or silage to harvest excess spring forage at dairy quality?

_____ Is there evidence of bloom in your alfalfa hay? _____ contaminant grasses? _____

_____ Can you buy dairy-quality alfalfa hay easier or cheaper than producing it yourself? _____

_____ Regardless of forage type, is there evidence of heating and/or mold in your hay? _____

_____ Is outside hay storage appropriate for your climate? _____

_____ If hay is purchased, on what basis do you buy? _____

V. NUTRIENT MANAGEMENT

- _____ Do you have a nutrient management plan? _____
- _____ Is it an approved plan by your state regulatory agency? _____
- _____ Have you implemented it? _____
- _____ How do you handle waste water from the milking facility? _____
- _____ Are you utilizing the nutrients where they do the most good on your farm? _____
- _____ Do you know which pastures/croplands need the most fertility? _____
- _____ Do you know the best time of the year to spread nutrients so they are most effective? _____
- _____ Do you soil test to monitor phosphorus levels? _____ salinity? _____ potassium? _____
- _____ What is the pH of the soil? _____
- _____ Could you change the way you store waste products that would allow better utilization? _____
- _____ Could you change the way you raise your animals to reduce the amount of waste products that need to be stored? _____

VI. ALTERNATIVE DAIRY FARMING

A. Minor dairy species

Even though all the questions thus far pertain to all dairy species, there are certain questions that must be asked when one is thinking of producing some of the minor dairy species, usually goats or sheep. These animals have their own unique challenges for someone wanting to produce a marketable product from their milk. Many dairy goats, for instance, are raised for show. These animals, while milking well in a small herd fed for showing, may not do well in a commercial herd in which economics is a bigger factor in production and feeding decisions.

- _____ Do you have access to good quality milking animals in your area? _____
- _____ Do you know how to select animals that will fit into your herd or flock? _____
- _____ Do you have a market for the milk or unique products that can be made from goat or sheep milk? _____
- _____ Are there other farmers or educators nearby who can give you information on how to produce good animals and milk from those animals? _____
- _____ Do you have a market for kids? _____
- _____ Do you have the facilities needed to raise and milk these animals? _____
- _____ Can you build or buy the needed facilities and appropriate equipment? _____
- _____ Do you have a financial plan? _____
- _____ Do you have a veterinarian who knows about sheep and goats? _____
- _____ Are there veterinary products available? _____

B. Seasonal dairies

Seasonal dairying means breeding cows to calve in a two month period, then drying them off at the same time, about ten months later. This can occur so the dry period is in the middle of winter in the North, but in the South, having the dry period during the hot summer months is often more feasible. Most seasonal dairies are pasture-based, using few purchased inputs. While being seasonal can be good for a farm's quality of life, there are problems associated with being seasonal. Getting cows bred in the narrow window necessary can be difficult. Some milk buyers are not happy with seasonal dairies, especially if those dairies are dry during a period of high milk demand.

- _____ Do you have the pasture available to provide the majority of forage for the herd? _____
- _____ Is your market or milk buyer accepting of you being seasonal? _____
- _____ Do the majority of your cows breed in the eight week window necessary to fit your season? _____
- _____ Can you buy in bred animals to meet your production goals? _____
- _____ Do you have an outlet to sell animals which don't breed within your window? _____

C. Organic dairies

The demand for organic milk is growing in all parts of the country. There is a lack of processors set up to process organic milk. The ones that are available are on the coasts and in Wisconsin primarily. For many farmers wanting to produce organic milk, the only alternative is to process and bottle it themselves. While consumers of organic milk and milk products have various reasons for buying these products, the main reasons are philosophical and related to perceived health benefits to themselves and the environment. For the farmer, raising animals to produce an organic product requires that certain things be done differently, such as the use of certified pastures and other feeds, no antibiotic use, and cleaning of equipment with certain specified products.

If you are interested in organic production, do you:

- _____ Know the regulations to raise and sell organic food products? _____
- _____ Have access to the allowed feeds and products? _____
- _____ Understand the rationale behind organic production? _____
- _____ Have a veterinarian available who is willing to work with you on raising animals without conventional medicines? _____
- _____ Have a processing plant close enough that is certified organic? _____
- _____ Know if the price you receive is adequate for the additional costs? _____

VII. MARKETING

Most cow dairies sell their milk through traditional milk channels and so are governed by the new milk marketing orders for their region.

What are your marketing goals? _____

- _____ Could you produce a more marketable product with a change in your breeding program?
- _____ Are you in an area where niche marketing could be established, such as near a metropolitan area where direct-marketed milk and milk products would have potential? _____

If you are interested in direct marketing, do you:

- _____ Know the training and licensing regulations? _____
- _____ Have labor available? _____
- _____ Have adequate capitalization of facilities and equipment? _____

VIII. ASSESSMENT OF INDIVIDUAL PASTURES

Routine pasture assessment can be used effectively as a feed budgeting process as well as an evaluation of how well your grazing program is working and how individual pastures (paddocks) should be managed. Individual pastures should be regularly evaluated to determine short-term management decisions, such as grazing pressure, fertility needs, forage availability within a short time span, potential for hay production, etc. Pasture assessment can be as important to your operation as animal evaluation (and economically, may be more important). Each pasture should be assessed at various times of the year. Additionally, when assessing a pasture, evaluate how previous management and use over time has influenced the pasture.

What are your pasture management goals? _____

_____ What changes in plant species are occurring? _____

_____ Are these changes desirable or undesirable? _____

_____ Are there spots of bare ground within pastures? _____

_____ Do you have any erosion problems? _____

_____ Is the pasture grazed fairly uniformly or are there areas of spot grazing? _____

_____ Is there adequate but not excessive residue in the pasture? _____

_____ Is the residue decomposing properly or is it thick enough to contribute to lack of seedling development of other species, such as clover? _____

_____ Are the animals doing a good job of controlling the edible weeds, such as ragweed, when vegetative? _____

_____ Which weeds or brush are not being controlled by grazing? _____

_____ Are there compaction or pugging problems? _____

_____ Could a change in water/mineral feeder location or the shape of pasture impact the grazing pattern? _____

_____ Is wildlife habitat appropriate? _____

_____ Is water runoff excessive, especially on slopes? _____

_____ Do you need more forage, which might be gained through an application of fertilizer or a longer rest period? _____

_____ Are pastures resting long enough to allow proper plant regrowth and replenishment of root reserves? _____

_____ Do you need to make better-quality forage available, which might be accomplished with haying earlier or using better grazing practices? _____

_____ Do you know how individual pastures rank in productivity? _____

_____ Are there areas of pastures which need fertilizer and other areas which don't? _____

_____ Which field areas dry out first, second, and last under drought conditions? _____

_____ Do you have a plan for which pastures are used at various times of the year? _____

_____ Do you drive on pastures, which may retard pasture growth and create compaction problems? _____

IX. ASSESSMENT OF SOILS

Soil is the natural resource foundation of any farm. Proper management of the soil is the basis for managing the plant-animal interface necessary for a sustainable livestock farm. Whole farm planning includes assessment of soil characteristics. First, study how everyday management influences nutrients, moisture levels and tilth. This is the basis for decisions on fertility and grazing, which will affect species diversity and erosion problems. It is important to understand where your quality soil is, as well as how to improve the quality of all your soil. A nutrient management plan can be used to determine sources of nutrients that can improve the farm's productivity at minimum costs.

- _____ Do you have soil maps of your farm and understand the productivity index of each soil type?
- _____ Do you have specific problems to address, such as fragipans, poor drainage, compaction? _____
- _____ What is the microbial activity in your soil? _____ What does the soil smell like? _____
- _____ What is the tilth? _____ What does a handful feel like? _____
- _____ Do you have a nutrient management plan for each pasture? _____
- _____ When was your last soil test? _____
- _____ What is soil pH, salinity and Na saturation? _____
- _____ Do you routinely use lime? _____
- _____ What is the organic matter level in your pastures/fields? _____
- _____ How deep is the dark surface layer? _____
 - _____ Is it less than the natural undisturbed soils in your area? _____
- _____ How many days does it take grass or crops to exhibit drought stress? _____
- _____ How hard are earthworms to find? _____
- _____ Is there evidence of earthworm activity such as castings on the surface? _____
- _____ How fast do manure piles and forage thatch degrade? _____
- _____ Are any plants yellow, spotty or purple-colored? _____
- _____ Do you have any soil nutrient deficiencies or imbalances that impair forage and animal production? _____
- _____ Do you have considerable variation of productivity level and nutrient level within pastures? _____
- _____ Are soil fertility levels adequate to meet forage production targets? _____
- _____ Are forage production targets too high, leaving inputs that are undesirable for environmental or economic reasons? _____
- _____ Would a change in fencing allow better use of pastures based on productivity of soil? _____
- _____ Are any erosion problems due to a lack of water flow control, lack of adequate cover or lack of infiltration? _____
- _____ Do you have soil compaction problems in any fields? _____
- _____ How long does it take for standing water to seep in? _____
- _____ Do you regularly sample soil of individual fields or soil types? _____

X. ASSESSMENT OF WATERSHED

Every farm is part of a watershed. Water flows onto the farm and leaves the farm. What happens in the process is the responsibility of the farm owner and can have an impact on the water quality downstream as well as influencing the soil erosion problems on the farm. An understanding of the geological formations of the farm may assist in evaluating water flow and managing the water quality.

- _____ What are the water drainage patterns into and from your farm? _____
- _____ Are there litter banks (debris piles, usually wood) present anywhere on your land? _____
- _____ How efficient are you in retaining water on your farm and in your soils? _____

Riparian areas are the edges of streams, wet weather creeks, ditches or any area where water flows through at various times of the year. Management of these areas can have an impact on erosion and water quality.

- _____ Do you have major riparian areas, with flowing water in them most of the time? _____
- _____ Do you have riparian areas with large amounts of water at limited times during the year? _____
- _____ Do you have a management plan for your riparian areas? _____
- _____ Does your plan allow livestock frequent, limited access to help manage the vegetation of riparian areas? _____
- _____ Are riparian areas managed for wildlife habitat? _____
- _____ Do you have buffer zones adjacent to the riparian areas? _____
- _____ Are farm ponds full of algae? _____
- _____ Considering your whole farm as a watershed, do nutrients that contribute to poor water quality leave your farm? _____
- _____ Do you time your fertilizing or spreading of litter/manure to prevent runoff of nutrients? _____
- _____ Do aquatic organisms downstream indicate good water quality? _____ Has this changed? _____
- _____ Do you use pesticides/herbicides tactically for localized infestation? _____
- _____ If using poultry litter or other manures, do you test soil to monitor nutrient management of individual pastures? _____
- _____ Does your soil absorb and retain rainfall? _____
- _____ Is the vegetation adequate to allow water penetration into the soil and prevent excessive water flow? _____
- _____ Are some areas overgrazed to the extent that water flow is excessive? _____
- _____ Do you have an understanding of the nutrient flow on your farm (inputs and outputs) and know what percentages are retained on the farm? _____

XI. SUMMARY

Now that you have completed the assessment of your farm, go back through the questions you indicated as high-priority items for increasing economic or environmental sustainability. Then use the sustainability manual to explore potential changes in your management program or planning. Spend time reviewing the areas that could be emphasized to allow you to meet your goals.

- _____ Have your perceptions of your weaknesses and strengths changed? _____
- _____ What are the highest priority areas for you to emphasize? _____
- _____ Have you put on paper your goals for your family and your operation? _____
- _____ Do you understand better the interactions occurring on your farm—i.e., how one decision affects another? _____

XII. SUGGESTED RESOURCES

A. ATTRA Publications

Listed below are ATTRA publications that may be useful for addressing many of the questions presented in the check sheet. These may be ordered at no charge by calling the ATTRA office, 1-800-346-9140. Some are also available at our website <<http://www.attra.ncat.org>>.

Sustainable Pasture Management
Rotational Grazing
Matching Livestock and Forage Resources in Controlled Grazing
Meeting the Nutritional Needs of Livestock with Pasture
Nutrient Cycling in Pastures
Whole Farm Nutrient Management
Sustainable Soil Management
Integrated Parasite Management for Livestock
Introduction to Paddock Design and Fencing-Water Systems for Controlled Grazing
Financial Tips and Resources for Grass Farmers
Alternative Fly Control
Grass Based and Seasonal Dairying

B. Other Resources

Sullivan, Karen, Robert DeClue, and Darrell Emmick. 2000. Prescribed Grazing and Feeding Management for Lactating Dairy Cows. New York State Grazing Lands Conservation Initiative. 58 p.

Notes

The electronic version of the Dairy
Farm Sustainability Checksheet is
located at:
[http://www.attra.org/attra-
pub/dairycheck. html](http://www.attra.org/attra-pub/dairycheck.html)

The ATTRA Project is operated by the National Center for Appropriate Technology under a grant from the Rural Business-Cooperative Service, U.S. Department of Agriculture. These organizations do not recommend or endorse products, companies, or individuals. ATTRA is located in the Ozark Mountains at the University of Arkansas in Fayetteville at P.O. Box 3657, Fayetteville, AR 72702. ATTRA staff members prefer to receive requests for information about sustainable agriculture via the toll-free number 800-346-9140.