October 2003 DAIRY-AIRE

Farm Business Plan

Lenders today expect dairy producers and other farm enterprises to have a business plan. A business plan should be more than your financial statement. It should include plans and goals for the business. How the business will deal with low commodity prices, lower production, as well as extra profits from higher prices and yields. Goals should be written and a roadmap developed on how and when the business plans to achieve these. A list of needs and objectives should be prioritized. Some dairies convene an annual management team (ag. lender, veterinarian, crop consultant, nutritionist, Extension agent, etc.) to help producers prioritize.

As we approach the end of the year, this is a good time to do (or redo) your business plan.

How Much Water Does Your Dairy Operation Use?

There are several ways dairy producers can determine the amount of water used on a daily basis. They include, but are not limited to the following:

1. Water meters can be purchased from local plumbing suppliers. They can be permanently or temporarily installed. Typically, water meters are recommended to measure drinking water of animals when herds are experiencing production or performance problems.

2. There are equations which can be used to calculate water intake of lactating dairy cattle. The following is one of the more commonly used equations.
   Water Intake (lbs./day) =

   35.25 + 1.58 x DMI (lbs./day)
   + 0.90 x milk yield (lbs./day)
   + 0.11 x sodium intake (grams/day)
   + 2.65 x weekly minimum temp °C

Example: *The average water intake for a cow producing 80 pounds of milking, consuming 54 pounds of dry matter, and 44 grams of sodium with a mean temperature of 70°F (21°C) would be 253 pounds of water or 30.3 gallons per cow daily. (water = 8.34 pounds)*

3. There are tables available to estimate the water intake for the various age groups of heifers and dry cows.

Calves & Heifers (gallons/day)	***Dry Cows*** (gallons/day)
1 mo – 1.3 to 2	7 to 13
2 mo – 1.5 to 2.4	
3 mo – 2.1 to 2.8	
4 mo – 3.0 to 3.5	
5 mo – 3.8 to 4.6	
15-18 mo – 5.9 to 7.1	
18-24 mo – 7.3 to 9.6	

4. Other areas where water is used on dairy operations include sprinkler systems, and milk houses and parlors. The following table lists water usage guidelines for milk houses and parlors.

Bulk Tanks	30-60 gallons per wash
Pipeline	75-125 gallons per wash
Misc. Equipment	30 gallons per wash

Cow Preparation	2 gallons per wash per cow
Parlor Floor	40-75 gallons per day
Milk House Floor	10-20 gallons per day

Midwest Plan Service

Bedded Packs for Dry and Lactating Cows

Bedded packs are common for youngstock, dry cows and occasionally for milking cows. Some people have argued that the bedded pack is a low-cost alternative because it would cost additional capital to add concrete alleys, stall dividers and mattresses to make it into a freestall barn. Others argue that the freestall barn is lower cost because an additional 40 square feet of building is needed for cows resting in a bedded pack and the daily operation cost is higher with the additional bedding requirements. (Assumes equal space for feed scrape alley and feed bunk area.) Therefore this article will not cover the economic analysis, except dairy producers need to do their own partial budget because of the variation in building and operating costs.

Other things to consider when building and managing a bedded pack barn:

In designing a bedded pack barn, the resting area needs to be separated from the feed and watering area. Where there is feed and water, there is more manure accumulation. So, it is better to have a concrete surface area that can be scraped 3 or more times a week, which will help keep the resting area cleaner. The bedded area does not require concrete; however, it does make the cleanout easier.

Bedded Pack Space Requirements

The bedded resting space should provide between 50 to 100 square feet per cow, depending on cow weight. A lying Holstein cow occupies approximately 25 square feet and needs almost twice that amount of pace for lying down or rising. Fifty square feet per cow is minimal and will require large amounts of bedding to keep the cows clean. Allowing 100 square feet per cow may be excessive, requiring more building space which increases capital cost. A design of 75 square feet per Holstein cow and 60 square feet per Jersey cow are common values for well-managed systems.

The bedded area should be rectangular with a maximum depth or width of 36 feet from the feed alley curb to the back of the bedded area. Cows tend to lie around the perimeter of the bedded space. The bedded surface can also be sloped downhill from the back to the front or scrape alley, which tends to make the cows all lie in the same orientation. To manage cow cleanliness, either the group size can be adjusted or the quantity of bedding used per day can be adjusted.

Bedding Requirements

As the bedding area per cow decreases, the amount of bedding required to keep the cows clean increases. Depending on cow weight, 15 to 25 pounds of bedding per day per cow should be added to the pen every day to maintain clean cows. Wood shavings, clean straw, corn fodder and waste hay are common bedding choices. Waste hay should be chopped before adding to ease cleaning the pack. Depending on the cost of bedding, this can cost $0.25 to $0.50 per cow per day.

Management

Policing the bedded area daily by removing manure patties can help maintain cleaner cows while minimizing the amount of bedding required to keep the cows clean. Some data suggest the amount of bedding needed can be reduced by 50% by policing the area. Daily removal of accumulated manure from adjacent alleys near feed and water can also help maintain cleaner cows.

Remodeling Buildings for Bedded Pack or Freestall Housing

Some post frame buildings such as machine sheds or loafing sheds can be remodeled into bedded pack or freestall pen arrangement. The typical width of a bedded resting area can range from 18’ to 36’.

Additional space is needed for a feed alley and feeding. Table 1 shows the minimum and recommended building width needed to accommodate different freestall barn arrangements.

Table 1 **Building Widths for Modeling Existing Buildings**								
Building Width	Freestall Barn Number of Rows and Feeding Location							
	1 Row	2 Row No inside feeding	2 Row Drive-by outside feeding	2 Row Drive-by inside feeding	3 Row Drive-by outside feeding	3 Row Drive-by inside feeding	4 Row Drive-Through feeding	6 Row Drive-Through feeding
Minimum Width, ft.	19	24	35	49	43	57	88	104
Recommended Width, ft.	22	25	38	52	48	62	94	114

What do We Know about Stray Voltage?

Adapted from an article by Douglas I. Reinemann, Ph. D. University of Wisconsin, Madison, Wisconsin

You may have read some recent articles containing confusing or conflicting opinions on the effects of "stray voltage" or other forms of electrical exposures on cows. Some people are very concerned about the possible effects of electricity on their cows and themselves. Dr. Reinemann from the University of Wisconsin has investigated these concerns. The short answer is that animals will be affected if voltage and current exposure levels get high enough; however there is a threshold level below which no harm will occur.

Studies done at the University of Wisconsin are only a small part of the long history of research on this topic. Studies on cows began over 40 years ago while studies on humans date back more than 100 years. These studies by hundreds of independent research groups in many countries have given us a very good understanding of the way that electricity affects living organisms and the levels of electrical exposure that can be problematic to cows. A summary of research on farm animals can be found on the web sites www.mrec.org and www.uwex.edu/uwmril.

Here are some of the notable findings:

- The first study of the effects of stray voltage on cows was published in New Zealand in 1962. It was concluded the ***3 volts*** (60 Hz rms) would be a likely minimum level for response.

- A review conducted by 15 scientists and published by the USDA in 1991 concluded that exposure levels should be kept below ***2-4 volts*** (60 Hz rms) to prevent adverse responses.

- Research in the past 10 years has shown that high frequency events require much higher voltage and current exposure levels to elicit the same response as 60 Hz voltage and current.

- The state of Minnesota commissioned a 4-year, $4 million study by a team of 8 national experts who concluded, ***"We have not found credible scientific evidence to verify the specific claim that currents in the earth or associated electrical parameters such as voltages, magnetic fields and electric fields, are causes of poor health and milk production in dairy herds."***

- The Attorney General of the State of Michigan conducted a lengthy investigation of concerns about ground currents, created by utility grounding. An administrative law judge ruled that the complaint be

dismissed because there was no evidence that a “stray voltage” problem resulted from the practice of grounding electrical distribution systems.

Wisconsin has established ***1 volt*** of stray voltage in areas where there is low contact (or 2 milliamps of 60 Hz current flowing through a cow) as its regulatory standard. The research clearly supports this as a safe exposure limit. This standard is meant to apply to 60 Hz voltages and currents carried by ground and neutral wires. The voltage and current exposure produced by “ground currents” are typically 100 to 1000 times lower than this level.

Wisconsin has had the most aggressive program of any state in the nation to deal with the stray voltage concerns of the public. Stray voltage is not a mystery. We know how to measure it and we know how to reduce it. If you have a concern about electrical exposure on your farm request a measurement of cow exposure levels from your utility company. Make sure your farm wiring and the utility wiring meet electrical safety codes and exposure guidelines. Always remember to keep yourself and your animals safe. Never compromise the safety of your farm’s electrical system in an attempt to reduce electrical exposure levels.

Investigating Abortions

David Wolfgang, PSU Extension Veterinarian

One of the greatest frustrations dairy producers face is the abortion of a good cow with a later term calf. Abortions can be due to genetic, environmental or infectious causes. Genetic losses can be due to heredity, errors in fertilization or mutations. Typically these occur very early in gestation (normally less than 30 days). These types of losses can in many ways be considered normal and is the reason the ideal first-service conception rate of 60% to 70% is about as good as it gets.

Environmental causes for fetal loss can be due to a toxic agent or summer heat stress. Fetal losses due to environment will be dependent on the level and duration of exposure and age of the fetus.

Abortions due to an infectious cause are the types of abortion with the best chance of diagnosis. However, labs around the country indicate that of all cattle abortions submitted, only 30% to 40% ever end with a definitive cause for the abortion. But, 90% of all definitive laboratory diagnoses are due to infectious agents. The most common infectious agents are bacterial (i.e. leptospira, campylobacteria fetus, trichomonas fetus and hemophilus somnus) and viruses (BVDV and IBR).

Fetal losses in cattle can be divided into several categories – failure to conceive immediately after breeding and early embryonic death from conception to day 42 of gestation. Abortions are classified as losses from day 42 through day 260. Premature deliveries and stillbirths are recorded from day 260 until the end of normal gestation (day 280 to 290).

What is Normal?

Most farms experience 2% to 5% observed abortions per year with a few more losses that are never seen or found. Therefore, the annual abortion rate on a typical farm is generally considered to be 5% to 8%.

Typically random losses would be spread out over the year, so start calculating a monthly rate based on animals pregnant per month or 6 to 12 months on smaller dairies. If there is a marked increase in the abortion rate in a very narrow window, say 2 to 4 weeks, then a problem may be brewing and action should be taken.

What to do?

It is important to handle all diagnostic samples properly to optimize the chances of a definitive diagnosis. Aborted fetuses and placenta tend to break down very quickly and proper preservation and prompt submission are critical. Bacterial and viral agents are very difficult to isolate. Failure to properly

preserve the tissue as soon as possible will greatly diminish the chances of recovering any pathogen or toxin.

Fresh(ly) aborted fetuses should be wrapped in a clean cloth and stored in a plastic garbage bag at refrigerated temperatures. Tissues should not be frozen nor laying in water. Frequently, aborted fetuses are already partially decomposed when they are expelled, so don't delay in cooling. Small fetuses (less than six months) can be kept intact. Veterinarians can necropsy older fetuses at the farm or veterinarian's office. A portion of the placenta (include part or all of a cotyledon) and blood samples from the dam may also be required for viral infections. Blood samples from several other cows in the same stage of gestation but who have not aborted also may need to be submitted. Check with your veterinarian. In any case, the fetus or tissues should be transported to the diagnostic lab within 24 hours of discovery of the abortion, commonly via overnight priority mail, packed in cool packs.