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Diluting Maintenance Cost and Marginal Milk

Dr. Charles Hutchinson, PhD, Dairy Specialist

On a typical Louisiana dairy farm feed costs accounts for half of all production costs on a dairy farm, there are several different markers (feed cost per cow per day, feed cost per hundred-weight [cwt] of milk produced and income over feed cost) used to evaluate feed cost. All of these markers have some usefulness as indicators of economic and production efficiency. Milk production per cow is another indicator of economic and production efficiency. The main objective is to determine at what level of milk production and feed cost yields the most profit for the farm, because at the end of the day the main thing that counts is the number of cwt produced and if the cost to produce the cwt is profitable.

Higher production per cow will tend to yield greater profits because cows convert feed to milk more efficiently as they produce more milk and eat more. At higher levels of milk production the maintenance cost of the cow is diluted. Maintenance cost is the feed cost associated with the cow being able to maintain normal body functions and the amount of feed needed for maintenance does not change regardless of the level of milk production. A typical Holstein cow requires 10 Mega-calories (Mcal) of Net Energy of Lactation (NE_L) per day just to maintain normal body functions. If her diet on a Dry Matter basis (DM) contains 0.76 Mcal/lb of NE_L , she must eat 13 lb of feed DM to meet maintenance requirements. If a cow produces 30 lb/day of milk, she needs an additional 10 Mcal of NE_L, she must consume 26 lb of feed which is twice as much feed or '2X maintenance' with 50% of her diet used for maintenance. If she produces 61 lb/day of milk, she needs to consume a total of 30 Mcal/day of NE_L or '3X maintenance.' As the cow produces more milk, the amount of feed needed for maintenance remains constant. Therefore the more milk a cow produces causes the maintenance cost to be diluted to a smaller percentage of the total feed cost per day. At '5X maintenance' (about 120 lb of milk) only 20% of feed NE_L goes toward maintenance and 80% into the bulk tank. Feed efficiency increases as a cow produces more milk up to a certain point. Feed efficiency is probably maximized when a cow is producing between 100 and 150 lb of milk daily.

Feed efficiency is not directly related to profitability. As the cow produces more milk and eats more feed, eventually the cow will no longer have the ability to consume more feed. Dry Matter Intake (DMI) is influenced by a variety of different variables such as cow comfort, heat stress, energy level of the diet, ration digestibility, palatability and others. Therefore, as cows produce more milk, their diets become more nutrient dense and contain ingredients that are more expensive. The following table* ranks feed according to cost per Mcal of NE_L with the lowest cost ingredients listed first.

1. Pasture – 2 to 3¢/MCal
2. Corn Silage – 4 to 5¢/Mcal
3. Corn grain and byproduct feeds – 5 to 8¢/Mcal
4. Alfalfa – 7 to 10¢/Mcal
5. Oilseeds and animal fat – 8 to 12¢/Mcal
6. Protected fats and protein supplements – 12 to 40¢/Mcal
7. Minerals, vitamins and buffers – very expensive per Mcal because they do not contain energy

*Table adapted from Focus on Profits Rather Than Feed Costs by M.J. VandeHaar, Ph.D. Alliance Nutrition ® Dairy webpage.

Feed cost per 100 pounds of milk produced is a common indicator of economic efficiency and decreases considerably as production increases from 30 to 60 lb of milk/cow/day. An example would be for cows producing 30 lb per day the feed cost per cow per day is $2.50 and for cows producing 60 lb per day the feed cost per cow per day is $3.00. Feed cost per cwt milk produced for each production level would be:

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Milk Level	Feed Cost	Feed Cost/CWT
30	$2.50	$2.50/30 X 100 = $8.33
60	$3.00	$3.00/60 X 100 = $5.00

Feed costs per 100 lb of production would further decrease above 60 lb of milk production, but at the same time feed cost per cow per day would continue to rise as you incorporate more of the expensive ingredients on a per unit of energy basis into the diet and DM intake continues to increase. However, feed and economic efficiency would still be on the positive side.

Now let's look at another example of feed costs per 100 lb of production and determine which ration is more profitable.

Milk Level	Feed Cost	Feed Cost/CWT
80	$3.50	$3.50/80 X 100 = $4.38
90	$4.50	$4.50/90 X 100 = $5.00

Milk is valued at $15.00 per cwt.

The difference in milk production is 10 lb per cow, feed cost per cow per day is $1.00 higher and feed cost / cwt is $0.62 higher. It appears that the milk level of 80 lb of milk would be more profitable. However, the price of milk is $0.15 per lb, so the extra 10 lb of milk would be worth $1.50 and it only cost $1.00 to get the extra 10 lb of milk. This would be considered marginal milk which is defined as the additional amount of milk that is produced from increasing feed intake or nutrient intake over and above the amount of feed and nutrients required to cover the total maintenance cost of the cow. The marginal milk cost in this case would be $1.00 for the extra 10 lb of milk produced per cow. This amounts to an extra $0.50 per cow per day of potential profit for cows producing 90 lb of milk. In this particular scenario the feed cost per cwt of milk produced is not a good economic or feed efficiency indicator, you have to take into consideration not only feed cost, and level of production, but also the value of the milk being produced.

Striving to increase milk production per cow will usually mean greater profitability. However, striving to maximize production requires more nutrient particularly energy dense rations which can lead to more digestive problems so close monitoring of forage DM content, overall feed quality and DM intake of the diet is required. The level of milk production and the feed cost associated with this level of milk production are key indicators of the profit potential of the herd; however, as milk production increases non-feed cost variables will also increase. Therefore, these factors should be taken into consideration in determining the level of milk production that is the most profitable for your operation.

Kidding and Difficult Births (Dystocia)

Rodney Johnson, LSU AgCenter Associate Agent

Dystocia, or difficult birth, is common in sheep or goats and causes the death of many lambs/kids and ewes/does. Yearling mothers are much more susceptible to problems than mature animals that have given birth previously. Obesity and lack of exercise during late pregnancy increase the chances of dystocia.

Stage 1:

Some signs that may be seen include uneasiness, kicking, pawing the ground, lying down and getting up frequently, and sporadic urinating or attempts at urination. There may also be some vaginal discharge and obvious uterine contractions. Visible signs of early labor may or may not be seen in all animals.

This stage lasts 1-8 hours and may be longer in first time mothers.

Stage 1 ends with the fetal parts entering the birth canal.

Stage 2:

Visible signs of second stage labor include appearance of the water sac and evidence of a foot or leg exiting the birth canal.

This stage lasts about 1-2 hours (15 to 30 minutes per lamb/kid).

Stage 2 ends with birth of the lamb/kid.

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Stage 3:

This stage is where the placenta or fetal membranes are passed. This occurs 15 to 20 minutes after the birth of the lamb/kid. Tradition states that it is not good for the ewe/doe to eat her placenta. In some cases, this is not true because it is a natural process that reduces predator attraction to the flock/herd or ewe/doe. The placenta is also rich in the hormone oxytocin, which aids in the milk let-down and the uterine involution processes.

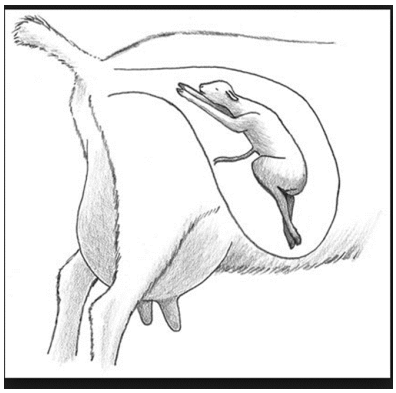
When to Give Assistance:

A. If an animal is in stage 1 of labor for longer than 8 hours.

B. If in stage 2, any of the following occurs:

1. The mother has been straining for 30 minutes with no progress.
2. The water sac is observed for longer than 1 hour and the animal is not trying to push.
3. The animal is showing signs of severe distress or fatigue, including bleeding from the rectum of the mother or a swollen tongue of the lamb or kid.
4. It can visually be determined that the lamb/kid is coming in an abnormal way. (For example, you see 3 or more feet, the tail, etc.)
5. If the fetal membranes have not passed within 12 hours after delivery.

Normal Fetal Position



Making Hay in the Springtime

Dr. Ed Twidwell, LSU AgCenter Extension Specialist

From late March to early May is a frustrating time to try and make hay in Louisiana. Frequent rains and poor hay drying weather are common at that time. In spite of the difficulties associated with springtime haymaking, there is a strong reason to attempt it. The best quality forage for making hay is available at that time on most Louisiana farms and ranches. Ryegrass, which most cattlemen and dairymen grow, and small grain crops are most suitable for harvesting during this time. Also, many clovers and alfalfa reach the proper cutting stage for the first harvest then. These crops offer the best quality of all the hay crops grown in Louisiana if they can be harvested and stored at the proper time. You never know what Mother Nature has in mind for summer conditions. It could be too wet or too dry for optimum production of high quality hay from the summer forage grasses. By making a springtime harvest of ryegrass or small grains, it provides some insurance against having to rely on poor to mediocre production from your summer grass hay fields.

The growth stage for harvesting these crops that offers good yields of high quality forage is the boot stage to early heading for ryegrass or small grains, bud to early flowering for alfalfa, and a similar growth stage for clovers. For white clover-ryegrass mixtures, cutting should be timed by the ryegrass maturity. For other mixtures, both the grass and clover should be considered.

From a weather standpoint, the best time to cut hay during spring months is usually immediately after the passage of a front. Often 3, 4 or more days of clear weather with lots of sunshine will follow a cool front. Producers who follow long range forecasts and take advantage of such periods have a better chance of making good quality hay.

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One tool that can be used to reduce field drying time during springtime is a conditioner or mower-conditioner. Conditioners speed up the drying of stems of clover, alfalfa, and cool-season grasses. A reduction of a few hours in drying time could determine whether a crop is ready to bale before the next rain comes or must be left in the field for one to several more days.

Hay should be allowed to dry in the swath as much as possible before raking. It dries faster and more uniformly in the swath. If rain catches it still in the swath and causes it to matt down against the ground, raking it may help. Use of a fluffer or tedder may be even more helpful.

When raking alfalfa or clover, care must be taken to minimize leaf shattering. The leaves are the best quality portion of the hay and any loss of leaves will reduce the overall hay quality. Once hay dries in the swath, raking will likely be less damaging if done at night or during early morning hours when there is some dew on the hay. It must then be allowed to dry some in the windrow to remove the dew before baling to permit safe storage.

The use of chemical drying agents may be helpful for quick drying of legume hay but has not proven very effective on grasses. Preservatives can be helpful in storing hay with slightly excessive moisture but have their limits.

Once hay is baled, it should be stored in a protected place as quickly as is convenient. Bales should be checked frequently during the first few days of storage for signs of heating. Heating, caused by storing hay that is too moist, can cause loss of quality or when more severe may even cause fire. Hay that begins extreme heating should be removed from storage and spread out to allow further drying. For more information on producing quality hay in the springtime, contact your local Extension agent.

Anaplasmosis: Time to Review Your Prevention Strategy

Dr. Christine Navarre, LSU AgCenter Extension Veterinarian

Anaplasmosis is an economically important disease of cattle in Louisiana and many parts of the United States. Anaplasmosis is endemic in some parts of the Gulf Coast, meaning it occurs regularly and basically is “native” to the area. Increased movement of cattle due to drought, hurricanes, etc. has spread anaplasmosis to areas previously considered free of the disease. There is some evidence that the tick species that spread anaplasmosis are also moving into new areas, allowing this disease to become endemic in new areas.

The implementation of the new Veterinary Feed Directive Rule (VFD) from the Food and Drug Administration in January, 2017 changed the status of the antibiotic used in feed or mineral to prevent anaplasmosis from over-the-counter to VFD. A VFD drug requires a veterinarian to prescribe use. There are requirements that must be met before a veterinarian can issue a VFD, so cattlemen should contact their veterinarian well in advance of vector season.

Transmission

Anaplasmosis is caused by the blood parasite *Anaplasma marginale.* This organism infects red blood cells, which leads to anemia (“low blood count”).

Anaplasmosis is transmitted by insects or people. Horseflies and some species of ticks are the main insect vectors. Spreading by other biting flies (such as stable flies), horn flies and mosquitoes is unlikely, but possible, during severe infestations.

People can spread anaplasmosis through reuse of needles and improper cleaning of instruments during dehorning, castration or tattooing. In one study, if a needle was used on an infected cow, the next animal had approximately a 60 percent chance of getting infected if the same needle was used. The incubation period from infection to clinical signs is 3-8 weeks. A typical scenario is a herd that is vaccinated and dewormed without changing needles to begin to show signs 3-8 weeks later.

Clinical Disease

Cattle less than two years of age show no signs or only mild signs that may be confused with other diseases such as pneumonia. Cattle older than two years of age have more severe disease and are more likely to die.

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Animals that become infected usually are infected for life and become carriers of the disease. These carrier animals are immune to future disease with the same strain but become a source of infection for other cattle. Outbreaks usually occur in summer and fall but can occur anytime.

Clinical Signs

- Fever
- Weakness
- Depressed attitude or aggression
- Decreased appetite
- Decreased milk production
- White or yellow color to the gums or vulva or yellow color to the whites of the eyes
- Death

Abortions may occur in females, and temporary infertility can occur in males. Animals with severe disease that live are likely to be "poor-doers" if they survive. Infected animals with less severe signs or no signs at all can have drops in milk production and infertility/embryonic death. This leads to decreased numbers of calves born and decreased weaning weights, both of which add to the financial losses due to anaplasmosis.

In endemic areas, some herds may suffer the less-noticeable problems without having obvious illnesses and deaths. This makes the disease harder to recognize, but financial losses are still severe.

Diagnosis

If anaplasmosis is suspected, producers should contact their veterinarians to confirm the diagnosis.

Treatment

Whether or not to treat sick cattle and others in a herd that may be incubating the disease depends on many factors and should be discussed with a veterinarian.

Prevention and Control

For herds **in endemic areas** there is constant potential for exposure, and total prevention or elimination of the disease from a herd is neither realistic nor recommended. The goal is to prevent and minimize clinical and subclinical disease and production losses.

Producers in endemic areas should assume they have carrier animals in their herds that look perfectly healthy. These carriers are protected from severe clinical disease but can be a source of infection to other cattle. The following measures can help reduce the spread of anaplasmosis:

- Do not reuse needles in animals older than 2 years of age, and clean equipment between each animal.
- Control ticks and flies. Control of horseflies can be difficult. Moving cattle away from horsefly breeding areas may help.
- Supply tetracycline products in feed or mineral supplements – particularly during the seasons when disease outbreaks are most likely (summer and fall). Purchase of these products now require a Veterinary Feed Directive from a veterinarian.
- Vaccination-available through veterinarians.

In non-endemic areas, prevention of infection may be possible with biosecurity measures, especially testing of any animals added to the herd with the cELISA or PCR. Since this test may miss animals in the early incubation phase, single use needles, proper cleaning of equipment and vector control are important in case a carrier slips into the herd undetected. Retesting these additions to the herd in six months to confirm their negative status also should be considered. Vaccination may also be considered if the risk of accidental introduction is high in the herd or area.

Introducing cattle from *nonendemic* areas to *endemic* areas should be done carefully. If possible, introduce new animals during the seasons when disease spread is less likely. Also, consider vaccination on arrival. If vaccination is not available, a veterinarian may recommend antibiotic alternatives.

Mosquito-borne equine diseases

Dr. Neely Walker, LSU AgCenter Extension Specialist

Mosquito season has officially arrived in Louisiana and along with them two potentially fatal diseases. West Nile Virus (WNV) and Eastern Equine Encephalomyelitis (EEE) are prevalent in Louisiana and can cause death in horses. So far 5 horses have died from EEE across Louisiana; the majority of which could have been prevented with vaccination.

West Nile Virus (WNV) and Eastern Equine Encephalomyelitis (EEE) are both viral diseases that can cause encephalitis and meningitis (infection of the brain and spinal cord or their protective covering). While each disease is caused by a different specific virus, they are both transmitted to horses by being bitten by an infected mosquito. Horses are considered to be a dead end hosts for WNV and EEE, meaning that the virus is not directly contagious from horse to horse. Horses that do become infected with West Nile Virus may have a loss of appetite, depression, fever, weakness or paralysis of the hind limbs, muscle fasciculation or muzzle twitching, impaired vision, ataxia (incoordination), head pressing, aimless wandering, convulsions, inability to swallow, circling, hyper-excitability, or coma. Currently there is no specific treatment for West Nile Virus and this disease has a 30% mortality rate. Those animals that become infected with EEE or "sleeping sickness" may show signs of fever, lethargy, and loss of appetite. Neurological signs usually develop 5 days after infection and include impaired vision, circling, head pressing, wandering, difficulty swallowing, hyper-excitability, ataxia (incoordination), convulsions and death. The mortality rate for Eastern Equine Encephalomyelitis usually exceeds 90% and most deaths occur 2-3 days after onset of neurologic signs.

There are vaccines currently available to help prevent West Nile Virus and Eastern Equine Encephalomyelitis. It is extremely important that horses are vaccinated according to the label and veterinary recommendations. A minimum of a yearly booster is required, while horses that are stressed, travel frequently due to show schedules, or live in warm, humid climates such as Louisiana, should be vaccinated twice a year. Vaccinating your horses against mosquito borne viruses is an inexpensive way to help reduce the possibility of infection; however, vaccination alone is not 100% effective. There are some easy steps you can take to prevent mosquitos from affecting your horses.

Avoidance:

- House horses indoors during peak periods of mosquito activity if possible (dusk & dawn).
- Reduce use of lighting during peak periods of activity.
- Use fans to help keep mosquitos off horses while they are stabled.
- Use chemical repellents specifically designed for use on horses.

Reduction:

- Eliminate areas of standing water on your property. For example, tires, manure storage areas, drainage areas with stagnant water, wheel barrows, pots, and shallow ponds.
- Clean out livestock water troughs weekly or add a supply of mosquito fish which will feed on mosquito larvae.
- Clean out storm drains and gutters in areas where horses are kept.

Research has shown that vaccination, while a vital component of reducing your horse's chance of becoming infected with West Nile Virus or Eastern Equine Encephalomyelitis. Vaccination should be done before peak mosquito breeding season and a multi-faceted management approach ensures reduced exposure. If you believe your horse may be infected with a mosquito borne virus or would like to create a program to reduce your farms exposure please contact your local veterinarian.

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