

Taking an Animals Temperature

One of the first signs of an infection is that an animal will have an elevated temperature. For that reason, a temperature should be taken for any animal that appears to be under the weather. It has become a common practice on many dairies to take daily temperatures for five days after calving.

A bulb type thermometer or digital thermometer can be used to take the temperature. A bulb thermometer needs to be shaken down below 96° F before use. The thermometer or probe should be lubricated prior to insertion. Most people use their own saliva as a lubricant but Vaseline or other suitable lubricant can be used. A bulb thermometer should be left in the rectum for 2-3 minutes. It is a good idea to have a string attached to the hole in the top of the thermometer (*Figure 1*). After the allotted time, remove the thermometer, wipe it clean, and read the temperature.



Figure 1

Digital thermometers have the advantage in that they are much faster. The temperature can be read as soon as the readout stops fluctuating (*Figure 2*).



Figure 2

Following are normal ranges for temperature, heart and respiration rates for animals at rest:

	Temperature	Heart Rate	Respiratory Rate
Newborn	101.4-104	130	56
1 month old	101.4-103.5	105	50
3 month old	101.4-103.5	99	40
6 month old	101-103.5	96	30
1 year old	99.5-103.5	80	18
Cows	99-103	80	14

Heart rates can be felt in the artery on the underside of the tail, the artery inside the hind leg, the chest of a calf, or heard with a stethoscope on the chest of a cow.

Tips on Giving Injections

A variety of injections of antibiotics, vitamins, hormones, vaccines, or dewormers are given on dairy farms. Using proper techniques will reduce frustration and improve performance of products being injected.

Keep several lengths and gauges of needles on hand. The gauge number and needle diameter are inversely related. For example, a 20-ga. needle is smaller than an 18-ga. needle. A dairy should have 16, 18, and 20-ga. needles on hand ranging in length from 3/4 to 2 inches. Always use the smallest needle available that will do the job to minimize tissue damage and leakage. Generally, for intramuscular injections use a 16 or 18 gauge needle, 1 to 2 inches long. Subcutaneous injections should be given with a 1/2 inch, 16 gauge needle. A 16 gauge, 2 inch needle is used for IV injections. Proportionately smaller needles can be used for calves. Syringes and needles are best sterilized by boiling in water for 10 minutes. At a minimum, syringes and needles should be cleaned with soap and water, rinsed thoroughly with water and allowed to air dry. Disposable syringes and needles are a cheap and viable option.

Most injectables need shaking before use. After shaking, inject the same amount of air into the bottle as the amount of liquid you wish to withdraw. This prevents a vacuum from forming as the liquid is withdrawn (*Figure 1*). If the liquid is thick, a 3/4 inch, 18 or 16-ga. needle will give a faster fill. After filling, tap the barrel of the syringe to send air bubbles to the top and expel the bubbles.



Figure 1

Be sure to read the label for type of injection. An improper injection can cause the solution to be less effective, increase withdrawal times, or cause injury to the animal. In addition, to lessen risk of infection, the injection site should be clean and dry. Applying disinfectant (alcohol) to the injection site is probably not worthwhile.

Intramuscular

The most common injection is intramuscular (IM). Antibiotics, for example, are mostly given IM. The three most desirable IM injection locations (*Figure 2*) are the thigh, thick part of the neck muscle, or rump (flat region between the hooks and pins).

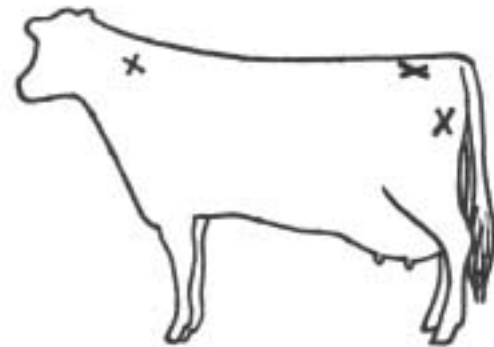


Figure 2

The rump is generally the easiest to inject, but has poor circulation causing slower absorption. For calves, use an 18-20 ga. needle, 1 inch long. Use a 16-18 ga., 1 1/2 inch needle on older animals for quicker delivery of the product deep into the muscle.

Once the injection site is chosen and the animal is properly restrained, use these tricks to help place the needle IM. Pinch or pull the skin a couple of inches from the intended injection site (*Figure 3*) or firmly slap the area 2-3 times to distract the animal. With a quick thrust, plant the needle almost straight in. With the needle and syringe properly placed, draw back the plunger (*Figure 4*). If blood appears in the syringe, the needle may be in a blood vessel and it should be withdrawn slightly before injection. If the solution goes directly into the blood, it may go to the brain and temporarily affect motor function. Do not exceed much more than 15 cc of fluid at one injection site in the adult animal. Smaller amounts should be used in the immature calves, down to 5 cc in the small calf. More than this can cause some muscle necrosis and stiffness. After a large dose is injected, it is a good idea to massage the area to help disperse the drug.

Subcutaneous

The subcutaneous (Sub-Q or SC) injection is made directly under the skin for slower absorption. Vaccines are usually given this route. A 1/2 inch, 16-gauge needle can be used if a small dosage is given.



Figure 3



Figure 4

Give subcutaneous injections in the neck near the shoulder, where a large lymph node bed nearby will help in absorption. *Figure 5* shows grabbing a fold of skin and thrusting the needle into the open cavity left by the fold of skin. Again, check for blood. If none, deposit the solution. The maximum SC injection is 20-30 cc in the adult and down to 7-10 cc in a calf. Massage the area briefly to reduce swelling.

Intravenous

When large volumes of solution are given (such as Calcium Dextrose or CMPK for milk fever) an intravenous (IV) injection is used where injection is made directly into the jugular vein. The jugular veins carry blood from the head to the heart and runs from the back of the jaw to the shoulder.

To make an intravenous injection the animal is generally restrained by a noselead with its head tied to the side. To assist with finding the vein, a rope or rubber tourniquet is usually placed on the neck below the proposed injection site. Finger or thumb pressure by you or an assistant against the vein may be used instead of a tourniquet. With proper pressure the vein becomes prominent, making insertion of the needle easier.



Figure 5

Hold the needle parallel to the vein with the beveled opening facing toward you as you push the needle through the skin (*Figure 6*). After it is through the skin, hold the needle a little more perpendicular to the neck as you push it through the wall of the vein. Once to the middle of the vein, lower the needle back parallel to the vein, then insert it the rest of the way being careful to keep it in the center of the vein.



Figure 6

Blood should flow from the inserted needle. If not, try pulling the needle out slightly, rotate a quarter turn and push back in. This procedure may get the beveled end more in the center of the vein.

Once the needle is properly positioned, the tourniquet or hand pressure on the lower vein is removed. At this point the blood can flow back to the heart and no or very little blood will be squirting from the needle. If blood continues to squirt from the needle at a high rate, it may be in the carotid artery which flows from the heart to the brain rather than in the jugular vein. Do not make injections into this artery. If in doubt, remove the needle and begin the procedure over. The carotid artery is deeper in the neck than the jugular vein and it is unlikely that you will hit it but it has happened.

When attaching the rubber tube or syringe to the needle, let a few drops of solution drip out to make sure that no air bubbles get into the vein. After attaching the tube or syringe, release the tourniquet or thumb pressure. Allow the solution to flow into the vein at a slow rate (use the manufacturer's rate of flow as a maximum). The rate of flow is determined by how high the bottle is held if a tube is being used. It should take 10-20 minutes to administer 300 ml.

If the flow rate is too fast, the animal may go into cardiac arrest. At the first signs of shortness of breath, rapid pulse or frothing from the mouth, discontinue the injection until the animal returns to normal. Then resume the injection at a slower flow rate.

If a second bottle is given, it should be administered at a slower rate than the first. If possible, monitor the heart with a stethoscope. If the heart beat becomes irregular, stop the IV immediately. If milk fever is being treated, it is not unusual for a cow to shake or shiver slightly or belch after treatment.

A low volume intravenous injection (<5 cc) can also be given in the tail vein. This vein can also be used to draw blood samples. Whether drawing a blood sample or giving an injection, the underside of the tail should be first cleaned with a disinfectant (*Figure 7*). The vein runs down the middle of the underside of the tail. You will want to insert the needle at an angle in a valley between the bony projections (*Figure 8*). After the needle is inserted into the vein, pull back on the plunger. The syringe will readily fill with blood if you are in the vein (*Figure 9*). If not, remove the needle and try again. Because the vein lies just next to the bone, you may contact the bone as you attempt to locate the vein. Withdraw the needle slightly if this happens.

Always consult your veterinarian for specific drug and treatment information. Always read the labels before administering any solutions. Check dosage, route of administration, and expiration dates. Keep drugs properly stored (most are refrigerated) and out of sunlight. Mix different solutions or give multiple injections only under the direction of a veterinarian. Many products are not compatible, and mixing them decreases effectiveness of each.



Figure 7



Figure 8



Figure 9

Minimizing Calf Scours

Calf scours is one of the most common diseases affecting young calves. It can be caused by infectious organisms, nutritional or environmental stresses. Most frequently, a multiple of factors are involved. The amount of effort needed to control scours will vary from farm to farm. Infectious causes of calf scours are presented in *Figure 1*. Traditionally, *E. coli*, coronavirus and rotavirus have been most commonly reported, but there has been an increase in reported severe outbreaks of cryptosporidia caused scours. As with most diseases, an ounce of prevention is worth a pound of cure.



Figure 2

<i>Infectious Cause of Scours</i>	
Bacterial Causes:	
Enterotoxigenic severe <i>E. Coli</i> (ETEC)	Most common cause of watery diarrhea with dehydration
Salmonella	Not common but outbreaks on individual farms can be severe
Viral Causes:	
Coronavirus and Rotavirus	Present in most herds. Often compounded by bacterial infections.
BVD Virus	Causes persistent diarrhea. Erosions on lips, tongue. IBR May cause listlessness, scours and death.
Protozoan Parasites:	
Cryptosporidium	Usually show signs of severe watery diarrhea, dehydration, anorexia and depression within 5 days up to 3 weeks of age.
Coccidiosis	Affects calves 3-4 weeks of age or older. Blood in feces.

Figure 1

Prevention

1. When weather permits, a clean grass lot is an ideal place for calves to be born. If a pen is used, it should be cleaned and disinfected between calvings (*Figure 2*).
2. Regardless of where the calf is born, a minimum of 2 quarts of colostrum should be fed within 30 minutes of birth. Feed from a bottle that was hand milked from the mother. Force-feed weak calves. Another 2 quarts can be

fed within 4-6 hours. Some herds have solved calf health problems by feeding a full gallon of colostrum as soon as possible after birth. The calves may drink the first 2 quarts, but need to be tubed the second 2 quarts. They are not force fed if not hungry for the second feeding 12 hours later, but usually regain their appetites for the feeding 24 hours later. Good colostrum will have a thick consistency and colostrum from 4-5 year old cows will have a 40% higher antibody content than that from 2 year olds. Keep frozen colostrum on hand from an older cow for those occasions when a cow may calve without adequate colostrum. An excellent method of freezing colostrum is to place 1 quart of colostrum in a 1-gallon zip-lock bag laid flat in the freezer. If the freezer is -5° F or below the colostrum should stay good for over a year. Colostrum can be thawed in warm water (<120° F) or in a microwave. The microwave should be set on low power for short periods and the thawed liquid poured out after each period to avoid overheating. Thawed colostrum should be at body temperature (101° F) when fed.

3. Calves should continue to receive colostrum for three days. The antibodies continue to provide immunity in the gut even though they are not absorbed intact into the bloodstream.
4. Milk replacers should contain less than .5% fiber and be made from milk by-products such as whey, dried skim milk and casein. It may be advantageous to stay on colostrum or whole milk in problem herds.
5. Clean calf-feeding utensils the same as milking equipment by using a warm rinse, hot detergent, acid rinse and allow to dry. Sanitize with 100 ppm chlorine before use.
6. Maintaining a closed herd may prevent introducing “hot bugs” to the dairy.
7. Isolate sick calves or feed and handle them last.



Figure 3

8. Provide a clean, dry, well-ventilated calf raising environment. Calf hutches prevent the transmission of infectious agents from calf to calf (Figure 3).
9. Consistently feed the correct amount of milk to each calf. A calf should receive 10 percent of its birth weight each day. A 90-pound calf gets 9 pounds per day or 4.5 pounds (2 quarts = 4.3 lbs.) in two equal feedings. A 70 lb. calf would receive about 1 3/4 quarts. Inconsistent or over-feeding can cause scours. On the other hand, some farmers have solved scour calf problems by gang feeding them twice as much milk with several nipples off one barrel.
10. If E. coli is the cause of a herd scours problem, vaccination of dry cows with a K-99 bearing E. coli bacterin will give protection to calves through the colostrum. Colostrum from the vaccinated cows should be fed for at least 3 days and preferably longer.
11. Vaccines against rotavirus-coronavirus are available. The cow may be vaccinated prior to calving to provide antibodies in the colostrum. If an oral vaccine is used on newborn calves it must be given prior to the colostrum. If scours from rota or corona viruses are still occurring, colostrum supplements (such as Lifeline or Gammulin) may solve the problem by feeding 1 ounce per feeding for the 1st few days and then dropping to one half ounce per feeding until the danger of scours has past.

Treatment

Calves should be checked twice daily for scours. The treatment course to take is influenced by past experiences in the herd. Mild cases may not need treatment or may benefit from administration of an electrolyte solution after milk feeding. Signs of dehydration (sunken eyes, loss of skin elasticity - skin does not spring back after pinching between two fingers) and profuse diarrhea requires a more aggressive treatment.

Scours causes death in calves by dehydration, loss of electrolytes and/or lack of nutrient absorption. Treatment needs to address these three areas while allowing the calves' immune systems time to fight off the infectious agents causing the scours.

1. Continue feeding the calf the same amount of milk as usual. It is beneficial to divide the daily milk intake into 3 or 4 feedings. If fed 4 times per day, a 90 lb. calf would get 1 quart per feeding or 1 1/3 quarts if fed three times per day.
2. Feed an equal amount of a commercially available electrolyte solution as milk for the first two days of treatment, and then decrease the amount to 3 quarts on days 3 and 4 and 2 quarts on days 5 and 6. Less electrolytes may be fed for a shorter duration for mild cases of scours or as the severity of scours decreases.

Do not mix the electrolyte solutions with the milk. Electrolyte solutions may be either acidic or alkaline. If an acidic solution is used, the solution can be fed 15 minutes after the milk. Regarding alkaline solutions, optimally they should be fed at least 4 hours prior to milk feeding. Alkaline solutions raise the pH of the digestive tract for up to 4 hours, which can interfere with milk protein digestion and result in loose stools. If a commercial electrolyte solution is not available, an alkaline solution can be mixed using ingredients in Figure 4.

3. If the calf does not voluntarily drink the milk or electrolyte solution, tube the calf with an esophageal feeder

Electrolyte Solution

Energy source:
 50 cc 50% dextrose solution
 (or 1/4 cup light Karo syrup)
 (or 1/2 package pectin)
 (do not use table sugar)

Electrolytes:
 1/2 teaspoon low sodium (Lite®) salt
 (use regular salt if not available)
 1/2 tablespoon baking soda Add warm water to
 make 2 quarts

Figure 4

or stomach tube (Figure 5). A severely dehydrated calf may need an intravenous administration of electrolytes.

4. Make sure fresh water is always available to the calf.



Figure 5

5. Dehydrated calves often suffer from hypothermia. Provide supplemental heat if needed.
6. There is disagreement regarding the benefits of antimicrobial drugs in treating calf scours.
 - a. Antimicrobials may help if the scours are caused by a bacterial agent that is susceptible to the drug being administered. Antibiotics do not kill viruses or protozoa.
 - b. If drugs are used for *E. coli* scours, they should be given orally. Injections are preferred for scours caused by *Salmonella*.
 - c. Misuse of drugs may cause or worsen scours.
 - d. Occasional loose feces is common in healthy calves. The practice of giving a few “scour pills” to every calf with loose feces perpetuates the idea that antibiotics are needed. The calves would have recovered on their own.

Attention to detail and cleanliness will solve most scour problems. Because of the wide range of causes, work with your veterinarian to fine tune a prevention and treatment program.

Treating Pinkeye

As warm weather approaches, we see an increase in pinkeye (Infectious Bovine Keratoconjunctivitis, or IBK). Bright sunlight, dust, wind, pollen and face flies irritate and increase the eyes' susceptibility to infection. Also, eartags placed too far out on the ear, so when the calf flicks its ear the tag nicks the eye, has been implicated in contributing to pinkeye. Pinkeye usually occurs in summer, but may occur any time during the year. Clip pastures, control flies, minimize dust and provide shade to help lessen chance of infection.

Even under the best management, outbreaks may occur. Young animals are generally more susceptible than older ones. Economic losses can be seen in decreased growth, actual damage to the eye, a possible drop in milk production and the cost of treating cattle.

Most pinkeye cases are caused by a bacterium called *Moraxella bovis*, which invades the eye after irritation. The bacteria produce a toxin, which erodes the eye coverings. Initial symptoms are a watering eye, blinking of the eye, or holding the eye closed (*Figure 1*). The animal may seek shade and stand with the affected eye away from the sun. The eye becomes red and swollen. As the disease progresses, a whitish, opaque spot appears in the center of the eye (*Figure 2*). In acute cases, this opaque spot enlarges, ruptures and results in blindness.



Figure 1



Figure 2

Start treatment as soon as pinkeye is diagnosed to minimize economic loss and prevent unnecessary suffering for the animal. To treat the animal, secure the head and examine the eye closely. With pinkeye there should be a white opaque spot in the middle of the eye. If the eye irritation is caused instead by a foreign object in the eye, the white opaque spot will be to the side of the cornea. If that is the case, you may be able to lift the eyelid and remove the foreign matter with a cotton swab. If the foreign object is deeply embedded it might have to be removed by a veterinarian using anesthetic and forceps or scalpel. IBR (red nose) also may cause a red and painful eye but usually both eyes are affected, there may not be a white opaque spot present and the discharge is more of a white, creamy pus rather than clear tears.

Many different antibodies and routes of administration have been attempted as treatments for pinkeye. The pinkeye infection usually clears after treatment but it also clears in most untreated animals, as the immune system will eventually eliminate it. Recent studies comparing different treatments conducted at the University of California at Davis yielded the following results:

1. The most effective treatment for pinkeye that they investigated was injecting 20 mg/kg (about 5 ml/100 lb) body weight of long acting oxytetracycline (LA-200) intramuscularly 2 to 3 days apart.
2. They found that the two injections of LA-200 plus feeding 2 gms daily of oxytetracycline for 10 days after the second injection reduced the incidence of pinkeye for the entire summer in herds with a high incidence of the disease.
3. Florfenicol (Nuflor) was injected intramuscularly at the rate of 3 ml/100 body weight two days apart and compared to a one dose SQ injection of 6 ml/100 lb body

weight. Both were effective in promoting faster healing than untreated animals.

4. Injecting Procaine penicillin G just beneath the thin layer of tissue on the surface of both eyeballs using a fine needle daily until healed was as effective in treating acute cases as the intramuscular injection of LA-200. It was not as effective in preventing recurrences or new cases of the disease as the LA-200 injection. Because of the difficulty of giving this type of injection, it does not seem like a feasible alternative to the LA-200 intramuscular injection.
5. Another treatment was to inject 1 ml procaine penicillin G with a fine needle under the tissue of the inner eyelid and depositing the liquid so a small “blip” appears under the inner eyelid tissue. The same procedure was tried with a mixture of 1 ml penicillin G and 1 ml dexamethasone. With or without dexamethasone, the injection of penicillin into the upper eyelid did not speed healing in these trials (A protocol claimed to be successful on some dairies is to inject a mixture of 3 ml procaine penicillin G and 3 ml dexamethasone with half given in the upper eyelid and half given in the lower eyelid).
6. Topical application of furazolidone spray daily for 3 days promoted recovery but was not as effective as the intramuscular injections of antibiotics.

Topical ointments that may be effective in speeding recovery include antibiotics such as oxytetracycline, gentamicin, terramycin and a neomycin-polymixin-B-bacitracin combination. These are generally applied 1 to 2 times a day up to several days. If convenient, applications up to 4 times per day may be more effective. Dairy producers have substituted the antibiotic preparation from a mastitis treatment tube if eye ointment was unavailable. To apply eye ointment, hold the tube almost parallel to the eye with your hand resting on the animals face. Move the tube backward across the eye as you make your deposit (*Figure 3*).



Figure 3

In addition to antibiotics, topical atropine can be applied 1 to 3 times daily to relieve pain and corticosteroids may be administered topically or injected into the underside of the eyelid to decrease corneal scarring. Do not inject corticosteroids into pregnant animals because it can cause abortion.

Applying an eye patch after treatment is advisable to prevent further irritation from sunlight, dust and wind, and prevent transmission to other animals. They probably have no effect on healing rate. Patches can be purchased or made from an old pair of blue jeans. When applying the patch with a bead of glue (example: Kamar adhesive), leave a 2 to 3-inch space without glue at the bottom for drainage (*Figure 4*). The patch should wear off in about 14 days and the eye should be healed. If not, repeat the patch after consulting with your veterinarian.



Figure 4

Other more exotic methods are being used to treat pinkeye. Some veterinarians sew the third eyelid closed with dissolvable suture instead of using a patch, to protect the eye after antibiotic therapy. Also, a contact lense with antibiotic on it, which attaches itself to the eye and upper eyelid, has been developed and shown to be quite effective. The contact dissolves after the antibiotic is worn out.

Several vaccines are available to help provide immunity against the bacteria, which causes pinkeye. They vary in effectiveness probably because there are many different strains of *Moraxella*. New vaccines are under development. Consult your veterinarian on vaccine use. Some cows can be carriers of the bacteria and never show symptoms of the disease, allowing it to spread to other animals by flies or direct animal-to-animal contact. Controlling flies by using insect tags and good sanitation will help prevent bacteria spread.

Some research has shown a benefit from good vitamin A nutrition in controlling pinkeye in confined cattle. Check your feed, and supplement vitamin A if the requirement is not met.

Treating Ringworm

Ringworm is a disease that commonly appears during winter months in animals housed indoors. It is caused by a fungus, *Trichophyton verrucosum*, that forms grayish, crusty or scabby ringlike lesions, hence the name ringworm. Although cattle of all ages may be affected, the disease is more prevalent in calves and yearlings. Although it causes minimal discomfort to the animal, ringworm is an unsightly disease that may lessen the value of affected animals, prevent them from being exhibited at shows and can be transmitted to humans.

Animals are exposed to the fungus by contact with infected equipment or animals. Lice are also thought to spread the disease. After exposure, the fungus grows down into the hair follicles, causing the hair to break off or fall out. Grayish plaques or crusts are seen 1 to 3 months after exposure (*Figure 1*). Ringworm is usually found around the eyes, ears, muzzle, and neck, but can also be located on other areas. Left untreated, the animal develops an immunity to the fungus and will eliminate it from their bodies, although some infections may be quite persistent. The fungus is killed by ultra-violet light and high doses of vitamin A seem to help resistance and recovery. This explains why calves are usually cured spontaneously when turned out on pasture in the spring.



Figure 1

Many different treatments are used effectively to treat ringworm. Just the lesions may be treated, the entire body sprayed, or medication given systemically. Very few treatments have official FDA clearance for use on dairy heifers so consult your veterinarian before initiation of treatment. If there are just a few lesions to treat, first remove the crusts with a stiff brush and a mild soap and water (*Figure 2*) or use a metal currycomb. Slight bleeding commonly occurs. Simply painting the lesions with iodine or other solutions

without first removing the crusts will give disappointing results, because the fungus is in the skin.



Figure 2

After the crust is removed, the most common remedy is to apply a tincture of iodine. Ringworm lesions need to be soaked thoroughly during each application (*Figure 3*). Prevent the solution from getting into the animal's eyes. The iodine may need to be applied daily or every other day until the ringworm is cured. Because ringworm is highly contagious to man, wear rubber gloves and scrub after working with infected cattle.



Figure 3

Other topical treatments that have proven effective are: equal parts tincture of iodine and glycerin, copper sulfate, 20% solution of sodium caprylate, ordinary household bleach, and even old tractor oil. Thiabendazole, although best known as a wormer, is a potent antifungal agent and is effective against ringworm when the paste is applied directly to the lesions. At the same time, a therapeutic deworming

dose may be given orally. A similar product is Dichlorophen, used at a concentration of 2% in ointment form or in alcoholic solutions. Dichlorophen will generally clear up ringworm after just a few dressings. Another antifungal agent, Captan, has been mixed with water to form a thick paste and applied to the lesions although it is not approved for use on food producing animals.

If the infection is widespread over the body, the entire body of the animal should be sprayed weekly using a high pressure sprayer to remove the crusts and apply the medication. The body should be thoroughly soaked and all animals in the group treated. Effective solutions are: Natamycin (an antibiotic), 2 to 5 percent lime-sulfur solution, an iodophor solution, .5 percent sodium hypochlorite (bleach) solution, or 3 percent Captan solution.

Systemic treatments are also effective. Research studies done many years ago showed an injection of 1 million I.U.'s of Vitamin A followed by a second injection two weeks later to be effective. More effective is 2 IV treatments one week apart consisting of 30 gm of sodium iodide in 250 ml of water. Oral administration of Griseofulvin is fast and effective but more expensive and not approved for food producing animals (*Figure 4*).



Figure 4

The fungus that causes ringworm is resilient and may survive up to 4 years in dry scales shed by the animal. Once the fungus is in the environment, it's difficult to prevent animals from being exposed to it. Thorough cleaning and disinfection with chlorine (Chlorox bleach) of walls, ceiling, floors, mangers and equipment may eliminate the fungus. A fungicide such as Captan may also be used.

Calves differ in susceptibility; some calves may have severe lesions while others in the same pen show no signs of the disease. Calves in poor condition are often the worst affected and maintaining a high standard of general health and nutrition will help to reduce the effects of ringworm. A Vitamin A injection or addition in the ration may improve the integrity of the skin so to resist infection.

The incidence and severity of ringworm can be kept to a minimum with good management. Treat infected animals. Provide clean, well-ventilated and well-lit pens for calves. Feed calves a properly balanced ration. Effective vaccines are available in many countries but have not been approved in the United States as of this publication. Unproven folk remedies include hanging Holly in the heifer shed out of reach of the calves and running billy goats with the calves.

Lice and Mange Infestations

Lice and mange have been common cattle pests for centuries in all parts of the world. Lice are more common than mange and can be classified as either sucking or biting. Biting lice feed on pieces of skin and hair particles, while the sucking lice actually suck blood from the host. Lice cause the animal to itch, which can lower feed consumption, efficiency, increase nervousness and lower milk production. Sucking lice may occasionally cause anemia and in extreme cases, death.

Diagnosis is not difficult, but many times lice remain unnoticed until they have already caused financial loss. The first indication may be cattle rubbing on feed bunks or fencelines (*Figure 1*). Heavy infestations may cause bare patches of skin to appear, as in *Figure 2*. If you part the hair and look closely in good light, you may confirm the diagnosis if you see lice on the skin or their eggs, called nits, stuck on the hair.



Figure 1



Figure 2

The three most common species of lice are:

- Long-nosed cattle louse (*Linognathus vituli*)
 - blood sucking
 - heads conical or pointed
 - retractable mouth tube for sucking blood
 - eggs are dark blue or blackish in color
 - location: dewlap, shoulders, neck, rump, flanks, topline, udder and under tail
- Little Blue Cattle Louse (*Solenopotes capillatus*)
 - blood sucking
 - stubby head, a smaller but fatter body
 - retractable mouth tube for sucking blood
 - eggs are pale yellowish that bend hair where attached
 - location: face, neck, around anus
- Cattle biting louse (*Bovicola bovis*)
 - most common of lice species on cattle
 - brown or reddish, broad heads with visible mandibles for chewing
 - very irritating for cattle
 - eggs are pale, translucent
 - location: neck, shoulders, back, rump, tail
- General:
 - life cycles: 3-4 weeks
 - live only on cattle
 - wingless, 1 to 2 mm long

Knowing the life cycle of lice helps in planning a control program. Cattle lice spend their entire life cycle as parasites on cattle. The nits are attached to the hair and hatch in about 7-8 days. The lice go through 3 nymph stages and reach adulthood in 15-21 days. They begin producing eggs 3 days later. Adults may live as long as 9-10 weeks. Lice usually die within hours if removed from the animal. Although they may live in warm straw for a couple of days, lice are usually spread by animal-to-animal contact.

Most problems with lice infestations are seen during winter and early spring. Longer hair coats are an ideal habitat. Also, cows are more likely to be confined during this time, unable to groom themselves and exposed to less sunlight.

Lice infestations can be controlled quite well with insecticides available on the market. If treatment is for the milking herd, make sure the product is approved for lactating cows.

Health

Always follow label recommendations for proper dosages, method of application and safety precautions. Generally, insecticide applications need to be repeated 2 weeks after the first treatment to kill recently hatched eggs, as insecticides do not affect the eggs. All animals within a group should be treated at the same time to prevent re-infestation of treated animals by untreated ones. If lice persists after 2 treatments, consult your veterinarian. He or she may recommend a more potent product.

If time permits, clip an 8 to 10-inch wide strip of hair down the topline to expose lice to a harsher environment before applying the insecticide (*Figure 3*). This should ensure more satisfactory results.

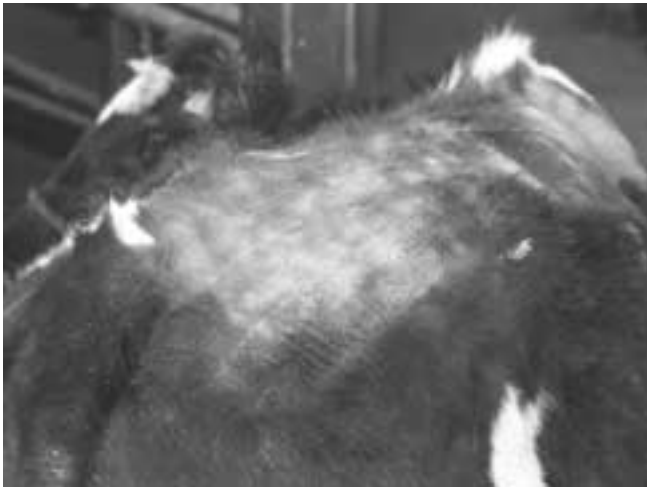
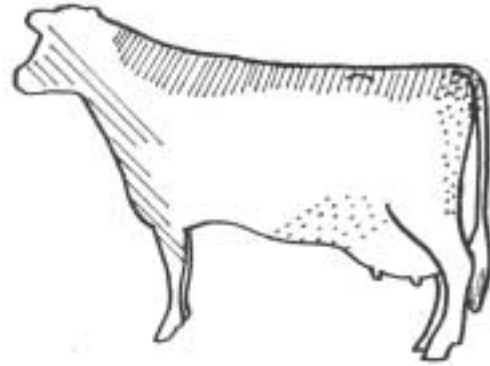


Figure 3

If lice have been a problem on your dairy, treat all cattle in late fall.

While an itching animal usually indicates lice, mange caused by mites may be the problem if lice or nits are not identified. Lice are usually found along the topline (*Figure 4*).

Chorioptic mange extends from around the tailhead down the inside of the hind legs to the belly. Sarcoptic mites prefer areas around the eyes, face, neck and brisket. Psoroptic mites generally prefer the topline. These are guidelines. Heavy infestations may cause lice or mites to extend over the whole body. Mites, depending on type, will live on the skin or burrow into the skin. Infested sites may have a crusted over appearance. Mites are identified by taking a skin scraping and checking for mites under a microscope.



- ///// indicates preferred infestation sites for biting lice and Psoroptic mites.
- \\\\\\ indicates preferred sites for Sarcoptic mites.
- indicates preferred sites for Chorioptic mites.

Figure 4

Injectables that contain ivermectin or doramectin will control both lice and mites. Pour-ons that control both lice and mange have the active ingredient of phosmet, permethrin, moxidectin, doramectin, ivermectin, or eprinomectin. Fenthion and famphur are effective against lice but not mites.

Choke

Choke in cattle may be caused by cattle attempting to swallow a large, firm object such as an apple, potato, beet or green ear of corn. It is more likely to occur if objects are eaten from a raised trough or if an apple is eaten off a tree. Animals are more likely to chew food into smaller pieces before swallowing if eaten off the ground.

Bloat and salivation are two of the main symptoms of choke in cattle. Bloat is caused because excess gas is trapped in the rumen. Salivation or frothing at the mouth occurs because the cow can't swallow her saliva. The cow may stand with its head and neck extended. She may shake her head or move it up and down. Harsh coughing is frequent. If the obstruction is not complete so that saliva can still pass down and gas escape, the only symptoms may be the animal standing by itself, head stretch outward and mouth slightly open.

To further help with diagnosis, consider whether the cow had access to objects that may have gotten lodged in her throat. Next try to palpate the obstruction in the esophagus. *Figure 1* shows the most common location of an obstruction. Do not confuse the larynx (Adam's apple) with an obstruction. If the obstruction is felt, place your thumbs or fingers in the jugular furrow below the object on both sides of the neck. Gradually work the object upward by applying steady pressure (*Figure 2*). The muscles of the esophagus tend to contract and relax intermittently which should allow you to move the object upward. When the object is brought to the top of the throat, have another person reach into the mouth to pull it out while still applying upward pressure on the throat.



Figure 1

If massaging fails to dislodge the object, it may be best to leave the animal to recover on its own. If it is a high starch object, such as a potato, beet or apple, the amylase in the sali-



Figure 2

va will digest enough of it so that it will eventually slide down into the rumen or you can try massaging it up again after a few hours or even days. In the mean time, a trocar and cannula or large gauge needle may have to be used to puncture the rumen to alleviate any bloat that may occur. A less appealing alternative is to reach in with your hand to dislodge the object. Hold the nose with one hand and cup your hand to extend it down the throat (*Figure 3*). Follow the upward outline of the throat so that you are guided into the esophagus rather than the windpipe (*Figure 4*). This maneuver should really only be done with mouth gag or block in the animal's mouth so that you can't be bitten. The molar teeth can cut off or crush a finger quite easily. After locating the object, grasp it between your thumb and fingers and slowly pull it out. If the object cannot be grasped in order to withdraw it, it might work to bend a ten-foot wire in half forming a loop large enough to go over the obstruction. The loop is passed into the esophagus, over the obstruction and then slowly withdrawn.



Figure 3



Figure 4



Figure 5

Only as an absolute last resort to save the life of an animal should a stomach tube or hose be used to attempt to push the object down the throat and into the rumen (*Figure 5*). Using this procedure may damage the esophagus or other organs or cause the object to get lodged further down the throat.

If drooling is the only symptom noted, rabies may be the cause. Do not expose yourself to the rabies virus by needlessly putting your hand into the animal's mouth. Frothing or drooling at the mouth is the only symptom that rabies and choke have in common. Bronchitis or throat infections may cause symptoms somewhat similar to choke.

If bloat is extreme and the cow is in immediate danger of dying or is unmanageable because of the discomfort, the bloat may have to be taken care of first. Usually, the best way to treat bloat is to pass a stomach tube into the rumen, relieving the gas. Because the esophagus is obstructed, the preferred method to relieve bloat when caused by choke is to puncture the rumen with a 6-inch long 12 gauge needle. This is preferred over using a bloat trocar or knife because there is less chance of rumen fluid contaminating the abdomen. Obviously, you have to use what you have on hand at the time.

Choke can be prevented by keeping objects such as apples and potatoes away from cows. Feedstuffs should be chopped so that they are not the size or shape that might cause choke.

Treating Abscesses

An abscess is a pus-filled swelling on an animal's body (*Figure 1*). It is usually caused by a bacterial infection. Causes of abscesses include puncture wounds, giving injections with a contaminated needle or syringe, and open wounds from routine operations such as castration. Once bacteria gain entry, they multiply and pus forms. The body tries to encase the infection to keep it from spreading. Usually as the bacteria continued to multiply, a thin spot will develop in the hide and eventually burst.



Figure 1

Abscesses need to be differentiated from hernias and hematomas. Hernias occur in the abdomen wall where there is an opening in the muscle tissue allowing a loop of intestines to protrude through. The hole in the abdomen wall can usually be felt by palpation. The most common location for hernias is near the navel, many times caused by a navel infection. Small hernias usually resolve themselves as the calf grows since the hole in the body wall remains the same size while the intestines increase in size until they no longer fit through the wall. Larger hernias may need attention by a veterinarian to surgically repair the abdomen wall or a metal or plastic hernia clamp can be applied to the loose fold of skin, holding the intestines in. The clamp is tightened every few days. The clamp falls off along with the loose skin in two weeks. With very large hernias the animal may need to be culled.

Hematomas occur when a blood vessel near the surface ruptures, usually because of an injury. The swelling is filled with blood and it is usually best not to treat them as they usually heal themselves. Opening up a hematoma may cause excessive bleeding or initiate a bacterial infection.

To determine the status of an abscess, puncture it with a sterile needle on a syringe. Check to see if the point of the needle is in the hallowed core. Draw some of the contents into the syringe. If it contains pus it is an abscess and can be opened (*Figure 2*). If it contains blood, it is a hematoma and should be left alone. If it contains pus tinged with blood or is not distinctly hollow, it may be an abscess that is not yet "ripe." Opening an abscess too soon may cause bacteria to get into the blood and spread to other parts of the body or all of the pus may not be removed and a new abscess may form next to the old one. If in doubt, it is best to leave it alone or consult your veterinarian.



Figure 2

Before opening the abscess, wash the area with a disinfectant. If the hair coat is long, the hair should be clipped first. With a hooked or curved surgical blade, cut into the abscess near the bottom to allow better drainage (*Figure 3*). Gently squeeze the pus out of the abscess into a container. Because the pus may contain huge numbers of infective bacteria it should be disposed of properly.

After the initial incision, widen the cut by removing a triangular piece of hide near the bottom of the abscess to insure good drainage (*Figure 4*). A wide opening will also insure that the abscess heals from the inside without closing up on itself. If the drainage site closes before the infection is cured, the abscess may reoccur.



Figure 3



Figure 4



Figure 5

The abscess should now be wiped out with a piece of gauze soaked in disinfectant (*Figure 5*). Repeat the process a couple of times. An alternative is to irrigate the wound with cold water from a garden hose if the opening is large enough. Finally, irrigate the wound with mild disinfectant from a squeeze bottle. Irrigation can continue daily until healed although this is usually not necessary. Leave the wound opened, unbandaged for it to heal. If flies are a problem, use a wound dressing that includes a fly repellent. In nonlactating animals, an intramuscular injection of a broad spectrum antibiotic may help the wound heal and prevent spread of the bacteria to other parts of the body.

Timely drainage of abscesses will promote faster healing with minimum stress to the animal. The danger of the abscess bursting inward and infecting other parts of the body are lessened. In addition, the pus can be disposed of rather than contaminating the housing area as it would if allowed to burst and drain naturally.

Proper Handling and Storage of Injectables

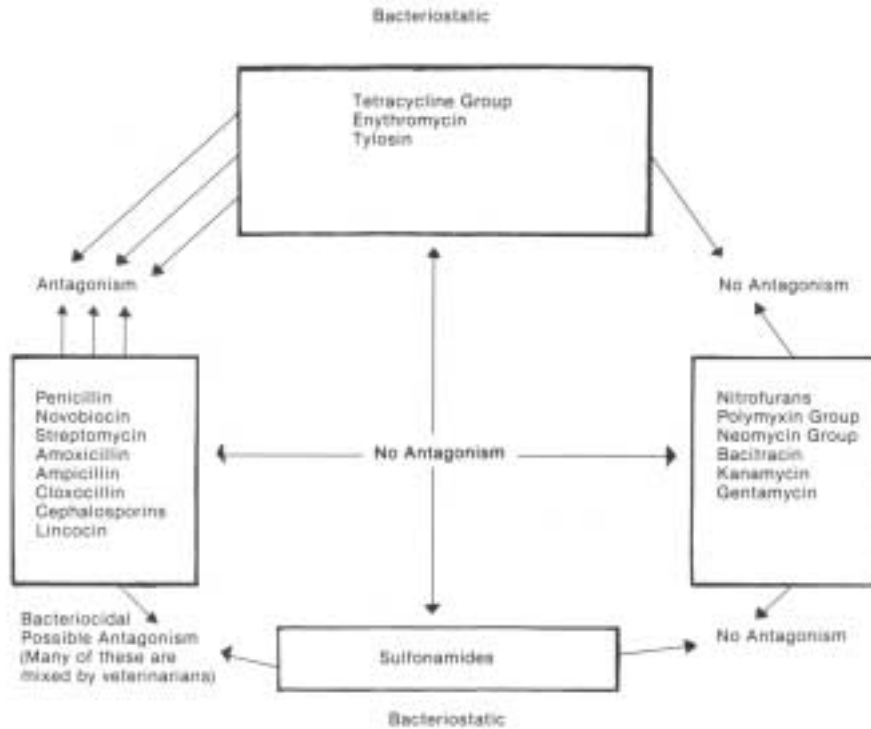


Figure 1

A variety of injectable solutions, including drugs, vaccines, hormones, and vitamin mixtures, contribute to better herd health if used properly. Improper handling or use is costly and dangerous.

In general, specific drugs are effective against only a few bacterial illnesses. Before treating sick animals, be sure to make a proper diagnosis and choose the most suitable drug. Do not use a “shotgun” approach.

Don’t use a combination of vaccines, drugs or antibiotics unless instructed by your veterinarian. Many drugs or vaccines are not compatible. For example, live vaccines should not be mixed with a killed vaccine, and drug and vaccine carriers may not mix. Figure 1 shows drugs that aren’t compatible because of different modes of action against the disease organism. For example, tetracycline slows the metabolism of bacteria. Because penicillin works best against bacteria with high metabolism rates, it is less effective in the presence of tetracycline. They should not be mixed.

Regulations require that drugs for lactating cows be stored on a different shelf or compartment than drugs for non-lactating cows. Shelves or compartments in the storage area must be clearly labeled “lactating” and “nonlactating”

(Figure 2). A drug for lactating cows will state so on the label, along with a milk-withdrawal time. If not, it’s not approved for lactating cows.



Figure 2

Drugs and vaccines must be properly stored (Figure 3) because they can lose effectiveness if warmed or exposed to sunlight. Figure 4 illustrates effects of different temperatures on these products. At 32° F biologicals remain effective for a long time. Biologicals freeze at a few degrees below water and may become useless if frozen. Generally, 35-40° F is a safe temperature range. Storage of solutions as shown in Figure 5 occurs far too often. Buy your vaccines and antibiotics from a reputable source. Make sure they are kept at a proper storage temperature until you receive them to insure proper effectiveness.



Figure 3

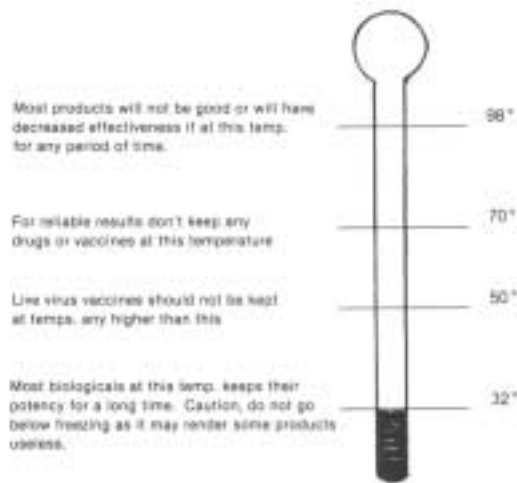


Figure 4



Figure 5

Vaccines should not be mixed in the same syringe unless instructed. Use separate injection sites on the animal if different vaccines are being injected to prevent their mixing in the animal. A modified-live vaccine should be reconstituted just prior to use, kept cold, out of sunlight and used within two hours.

Advantages of modified live vaccines compared to killed virus vaccines are : there is less chance of an adverse reaction to the injection, they give a faster and stronger immune response, only one dose is required and they are less expensive. The advantages of a killed vaccine are that they are more stable in storage, safer to use on pregnant animals, no chance of reverting to virulent form, no mixing required and less likely to cause immunosuppression.

Avoid administering vaccines when animals are stressed. Do not vaccinate within 24 hours of trucking. Avoid vaccinating on hot days. On warm days vaccinate early in the morning. Don't vaccinate cows from 2 days before to 5 days after calving. Poor nutrition and parasites will suppress the immune response.

Always check the expiration date on the bottle and try to use the solution before that date (*Figure 6*). If stored properly, antibiotics will generally still be good for a short time past the expiration date. Consult your veterinarian if in doubt. If vaccines go beyond their expiration dates, discarding them is generally recommended.

When filling a syringe from a bottle, take care to avoid contaminating the remaining contents. Insert only clean needles through the bottle's rubber stopper. Once solution is removed, it should not be put back. Discard any unused solution in the syringe rather than risk contaminating the bottle's contents. Even under the best conditions, the shelf lives of partially used bottles of biologicals, especially live vaccines, are usually reduced. For this reason, buy injectables in small bottles that will be used quickly. Vaccinations should be set up so that the whole bottle is used on the same day.

Syringes and needles are best sterilized by boiling in water for 10 minutes (*Figure 7*). After boiling, allow them to dry thoroughly before storage. Be careful to avoid contamination before use. Store them in the original sterilized containers or plastic sandwich bags (*Figure 8*). Inspect needles and discard those that are bent or have burrs on the points. If boiling the instruments is not convenient, use disposable items or disinfect by filling the instrument with a 70% alcohol solution and squirting out the contents. Make sure all alcohol is forced out. A small amount of alcohol left in the syringe may decrease effectiveness of the biological and cause irritation to animal tissue. It is best to rinse with water a couple of times after using any disinfectant. After the instruments are cleaned, be careful to avoid contamination before use.

Finally, read the label and give proper doses based on the animal's weight. Too small a dose will probably be ineffective. Exceed label dosage recommendations only under directions from your veterinarian. Excessive dosages can injure or kill the patient and will increase withdrawal times.

Develop a complete vaccination program as part of a complete herd health program which includes sanitation, parasite and fly control, balanced rations and animal comfort.



Figure 6



Figure 7



Figure 8