Tips on Giving Injections

A variety of injections of antibiotics, vitamins, hormones, vaccines, or dewormers is 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 18 or 20 gauge needles, 1 to 2 inches long. Subcutaneous injections can be given with a 1/2 inch, 16 or 18-gauge needle.

A 16 or 18 gauge, 1 ½ to 2 inch needle is used for IV injections. Proportionately smaller needles can be used for calves.

Disposable syringes and needles are a cheap and viable option. Reusable syringes are best sterilized by boiling in water for 10 minutes. At a minimum, syringes should be cleaned with soap and water, rinsed thoroughly with water and allowed to air dry. Needles should not be reused.

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 This prevents a vacuum from forming as the liquid is withdrawn (Figure 1).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.

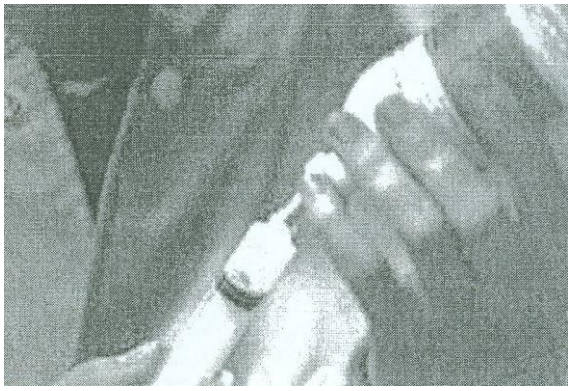

Figure 1

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).

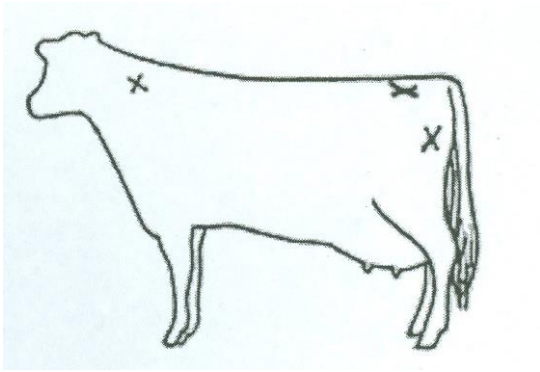

Figure 2

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

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 15-20 ml of fluid at one injection site in the adult animal. Smaller amounts should be used in the immature calves, down to 5 ml 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 or 18-gauge needle can be used if a small dosage is given.

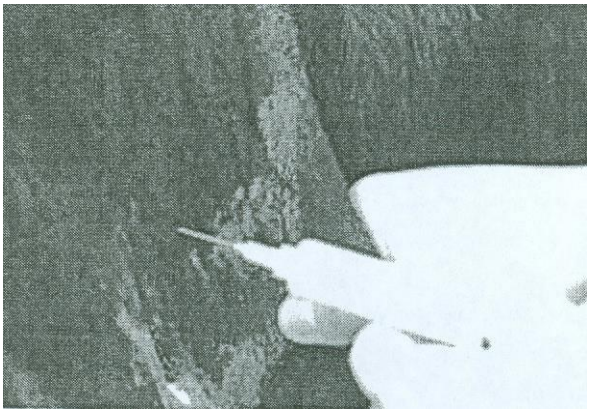

Figure 3

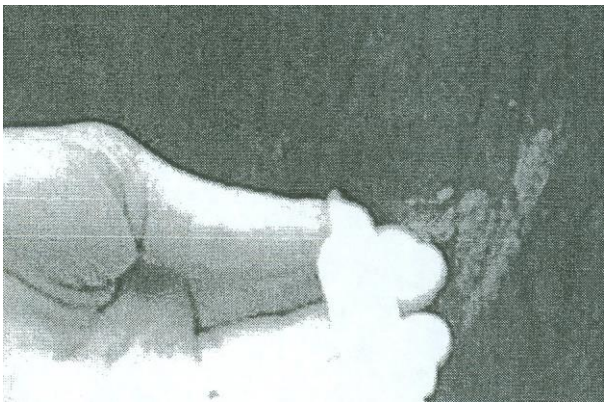

Figure 4

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. Large volumes (up to 500 ml) can be given in the adult; up to 50-60 ml is a safe maximum 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 perform 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 can 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.

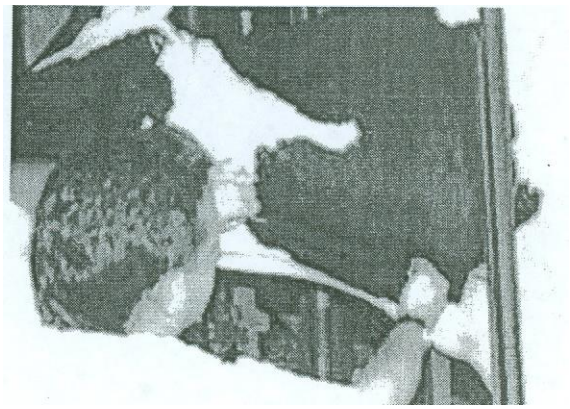

Figure 6

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 perform 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, or give subcutaneously if this is an option.

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 heartbeat becomes irregular, stop the IV immediately. If milk fever is being treated, a cow may shake or shiver slightly or belch after treatment. A low volume intravenous injection (<5 ml) 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

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