No. 350

OKLAHOMA COOPERATIVE EXTENSION SERVICE
4-H Youth Development

How to Vaccinate

Oklahoma Cooperative Extension Service • Division of Agricultural Sciences and Natural Resources

Why Vaccinate?

You can help animals protect themselves against certain diseases by vaccinating them. Vaccinating is injecting certain protective substances into cattle and other animals. These substances, called vaccines, are usually some form of the organism that causes the disease. Vaccines may contain killed cells, parts of cells, or live organisms that have been changed by growing in artificial media or toxins, which are chemical substances produced by the disease-causing organisms.

Some diseases of cattle for which we use vaccines are:

1. Blackleg
2. Brucellosis
3. Infectious bovine rhinotracheitis (IBR)
4. Bovine virus diarrhea (BVD)

By injecting cattle with these vaccines on a yearly basis, you help protect the cattle from getting these diseases for that year.

The Brucellosis vaccine must be given by a licensed veterinarian. Special care must be exercised when handling this vaccine because if a person is injected with even a small amount of this vaccine, they can develop Brucellosis.

Restraint

All vaccines must somehow be put into the animal's body. It may cause pain or distress to the animal for a short time. To vaccinate the animal without injury to the handler and to minimize stress to the animal, the animal needs to be restrained. Some common ways to restrain beef project animals are (1) with a halter or (2) with a cattle head gate or a chute.

Head gate (Figure 1) or a chute is the safest and best way to restrain a beef project animal.

Halter (Figure 2) restraint is possible with a very gentle, well-trained animal. However, the slight pain of putting a needle through the skin often turns the calmest animal into a lunging, frightened beast. If your project animal jerks violently just as you are about to inject the vaccine, you are likely to be hurt by the animal, lose the dose of vaccine, and break your needle or syringe. Therefore, it is always a good idea to find a chute or head gate for restraining your animal before attempting to vaccinate.

Vaccination Process

You will need a syringe (Figures 3 and 4); a needle, preferably 16 or 18 gauge; and the right vaccine (Figure 5) to vaccinate your animal properly. The ideal equipment for vaccinating livestock is a

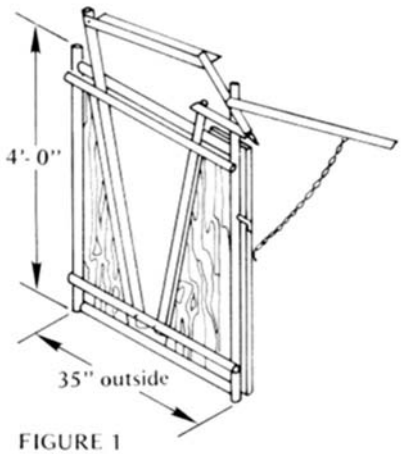

FIGURE 1

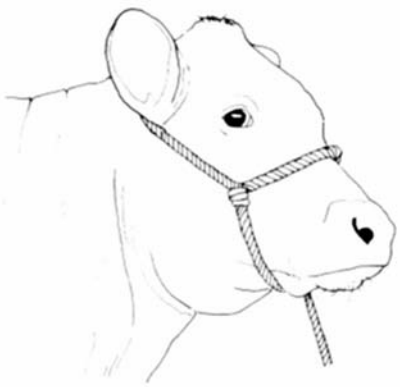
FIGURE 2

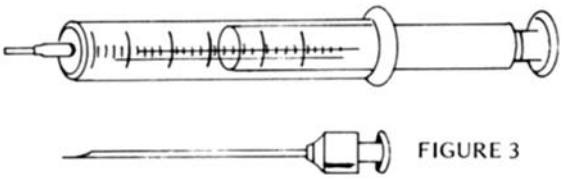

FIGURE 3

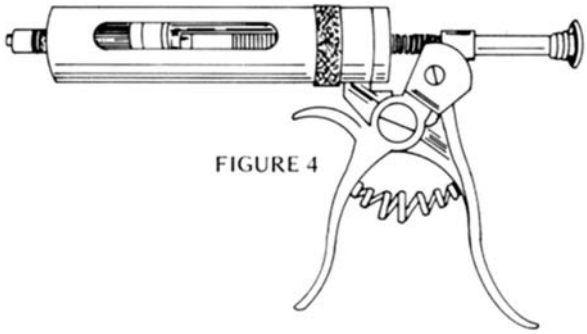

FIGURE 4

FIGURE 5

disposable syringe and needle used only once. If this equipment is not available, then a metal syringe with glass barrel can be used to vaccinate livestock (Figure 4). If the metal syringe has been used before, it should be taken apart and sterilized. Never use syringes and needles that have been sterilized in chemical disinfectants. Sterilize all syringes and needles used for vaccines by boiling in distilled water for 20 minutes. Chemical disinfectants will destroy modified–live and live vaccines. Do not waste the effort of livestock handling and the cost of vaccine by trying to clean equipment in alcohol or some other chemical disinfectant.

The syringe is put together after cleaning and a new needle put on the tip. Draw into the syringe an amount of air about equal to the volume of vaccine you want to use. Then, holding the bottle above, insert the needle into the bottle of vaccine, expel the air into the bottle, and draw the vaccine into the syringe by pulling back the plunger.

If you now have your animal restrained in a chute or head gate, you are ready to vaccinate. You will need to read the label of the vaccine to find out whether the vaccine should be given into the muscle (intramuscular) or under the skin (subcutaneous).

If you are doing a subcutaneous injection, you will want to pick up a fold of skin on the neck or shoulder between your fingers and insert the needle into the space just beneath the fold of skin (Figure 6). After the needle has penetrated its full length ($^3/_4$ to 1 inch), you expel the vaccine by pushing on the plunger until the syringe is empty.

You will want to keep a firm grip of the syringe during this process because the animal is likely to move, jerk, jump, or in some way try to get away from you.

After the syringe is emptied, the needle can be taken out of the skin. Be careful you do not jab or stick the needle into someone who may be helping hold the animal.

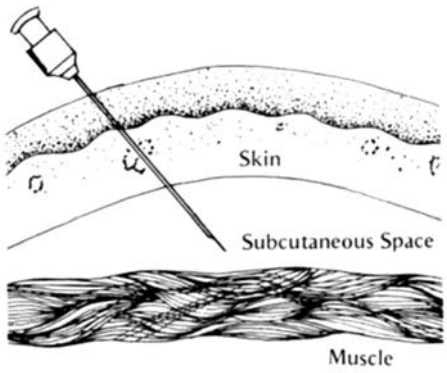

FIGURE 6

If an intramuscular injection is required, you need to use a longer needle, preferable 1 $^1/_2$ inches. Intramuscular injections should be given in the neck muscle just in front of the shoulder. Never give an intramuscular injection high in the hip muscle where the prime meat cuts are located. Blemishes resulting from injection site require trimming the carcass, which can be very expensive if prime cuts have to be trimmed (Figure 7). A good way to put the needle in place is to give the animal a couple of gentle slaps with your hand and then quickly thrust the needle deeply into the muscle. Once the needle is in place in the muscle you can attach the syringe to the hub of the needle. Apply negative pressure (pull back on syringe) to be sure you are not in a blood vessel. If blood is pulled into the syringe when negative pressure is applied, do not give vaccine, remove syringe and reposition needle into muscle and repeat the process. Inject the animal with the vaccine only after you do not get blood back upon applying negative pressure to the syringe. As soon as the syringe is empty, quickly withdraw the syringe with the needle still attached.

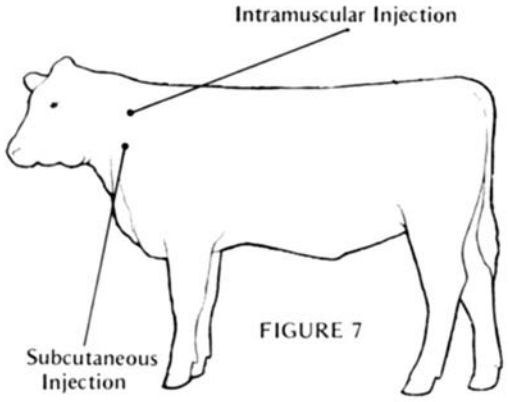

FIGURE 7

A few vaccines are given intradermally, which means into the layers of skin. This method of vaccination requires more skill than you have and should be done by a trained person such as a veterinarian.

Some vaccines are irritating to the tissues for a short time after injection. Your animal may be a bit restless because of this pain. Usually it goes away in a short time. Also, an irritating vaccine will cause some swelling for a while after its injection.

If you use a dirty syringe or get some bacteria such as streptococci into the injection area, an abscess may develop. This can either become a hard "knot" at the point where you put the vaccine or may rupture and drain a bloody or yellow pus. If this happens, you should ask your veterinarian to examine and treat the problem.

After you have finished vaccinating, you should properly dispose of the ("one-time" use) disposable syringes and all needles or, if you use a metal syringe, properly sterilize before reusing.

Activities

1. Contact your local veterinarians to inquiry about the possibility of going with them on their farm visits to vaccinate livestock. Be sure to ask the veterinarian about recommendations on properly handling, administrating, and storing vaccines.
2. County Extension educators sometimes have animal demonstrations where a veterinarian or Extension specialist shows how to do certain procedures on animals. Attend one of these demonstrations and learn from an expert how to vaccinate.
3. Visit a local livestock supply store. Make a list of all the vaccines that are available there.
4. Ask your veterinarian what vaccines he recommends for the following animals:
   a. Calf from birth to 1 year of age.
   b. Replacement breeding animal (cow or bull).
   c. Steers and heifers being finished for slaughter.

References

1. Southern Regional Beef Cow-Calf Handbook, available from Beef Extension office, your state university.
2. Extension Publications of Beef Cattle, available from County Extension office.
3. Beef Cattle Science, 5th ed., M.E. Ensminger Interstate Printers and Publishers, Danville, IL, 1976.
4. Keep Livestock Healthy, N. Bruce Haynes, Gradenway Publishers, 1978.

For More Information

Contact your local Cooperative Extension Service office or local veterinarian.

How well do you understand vaccination?

1. List the ideal equipment to use when vaccinating livestock.

   a.

   b.

2. Why is it important to have good restraint while vaccinating your animal?

   a.

   b.

   c.

3. List some things that can happen to your project animal after an injection of vaccine.

   a.

   b.

   c.

   d.

4. List 2 diseases for which cattle are often vaccinated.

   a.

   b.

5. What is a vaccine?

6. Look at the label of a bottle of vaccine. List below some different kinds of information on that label.

   a. Name of manufacturer

   b.

   c.

   d.

   e.

   f.

   g.

The Oklahoma Cooperative Extension Service
Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Original manuscript was prepared by the Southern Region 4-H Literature Committee, Ralph F. Hall, D.V.M., the University of Tennessee Agricultural Extension Service, senior author. This revised edition was prepared by Dr. Carolynn MacAllister, assistant professor/extension veterinarian, Oklahoma State University, Stillwater, OK.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Samuel E. Curl, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Dean of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of $.20 per copy. 0404.