THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
Popular Article
Oct, 2026 Vol.6(10), 3408-3412

Deworming and Vaccination in Livestock: A Practical Guide for Healthy Herds

Tamanna Agrawal[1*], Kapil Dharmes[2], Deepa Choudhary[3], Virendra Singh[1], Sakshi Rathore[4]
[1] M.V.Sc Scholar, Department of Veterinary Anatomy, CVAS, Bikaner
[2] M.V.Sc Scholar, Department of Veterinary Anatomy, GADVASU, Ludhiana
[3] M.V.Sc Scholar, Department of Veterinary Anatomy, CVAS, Bikaner
[4] PhD Scholar, Department of Veterinary Anatomy, CVAS, Bikaner
*Corresponding Author: Tamanna Agrawal
email id: tamanamvsc@gmail.com
doi.org/10.5281/ScienceWorld.24097776

Introduction

The success and failure of livestock farming is based on the concept of the health of the herd. An animal with a good health grows faster, produces more milk or meat, and in return produces more profit. A sick animal produces decrease in productivity and drains money of the owner through treatment costs and sometimes death. There are several tools available to farmers among which 2 concepts come out be the most cost-effective and essential in order to enhance production and health of the animal -**deworming** and **vaccination**.

Deworming refer to the clearing of the animal body by internal parasites that quietly steal nutrients and make animal unhealthy in terms of production.The vaccination builds immunity against infectious diseases that can wipe out entire herds in single exposure if the disease is transmittable or contagious. Together, both these concept form the backbone of any sound animal health programme (Sastry & Thomas, *Livestock Production Management*).

Recognizing of Healthy animal from the diseased one

Before treatment of animal against any disease, a farmer should be well educated enough to recognize a characteristic of a healthy animal. A healthy animal is indicated by holding its head up, stays with the herd and moves in coordinated way with other animals, eats greedily and perform normal rumination (twice every three minutes in cattle). Also, the skin of the animal is soft and elastic with uniform hair coat and moist muzzle and nostrils in case of cattle. The eyes of the animal are bright and alert, with lack of any abnormal discharges. The consistency of the dung is semi-solid in appearance in case of cattle

and pellet-like in sheep and goats. The colour of urine is clear and straw colored with the absence of discharge from the vulva or tail. The body temperature, breathing, and pulse rate of animals when measured using instruments all remain within the normal limits (FAO, *Lesson 5: Aspect of a Healthy Animal*).

On the other hand, a sick animal shows the opposite signs. The signs include are lower down hanging of head, separation or isolation from the herd, lack of coordination and loss of appetite. The rumination of animal either fluctuates or completely stops. The skin may show patches or itching, especially with external parasites or in diseased conditions. There may be appearance of vesicles on the muzzle and nostrils followed by nasal discharge, sunken eyes, and excessive tearing or glued eyelids. Constipation, dark or bloody urine, and discharge from the genitalia are further sign that indicate unhealthy status of animal. The quality and quantity of milk may also change.

Any deviation from normal functioning of tissues be it physical or mental state the animal is defined in diseased condition. It can be infectious, non-infectious, or parasitic, and it always causes loss of production, stunted growth, or even death. The farm manager has a duty to observe animals carefully every day, provide first aid where possible, and call a veterinarian when needed (Pfeiffer, *Book on Health Management*).

Deworming: Removing the Hidden Thieves

Deworming, also called worming or dehelminthisation, is the practice of giving an anthelmintic drug to an animal to get rid of helminth parasites — roundworms, flukes, and tapeworms (Sastry & Thomas, *Livestock Production Management*). These parasites live inside or outside the body of the animal and consume nutrients that should be used to promote growth, milk production, or pregnancy of the animal. The most suitable time to deworm animal is in the **early stage of infection** as at that time the worm load is still small and the drug can act in the most effective manner.

The schedule of deworming varies with the age and the class of stock. In adult animals, deworming is done based on dung examination. In adult females, it is carried out after parturition. Young animals should be dewormed every month. The stock of animals that become older needs to be dewormed at four- to six-month intervals. The heifers should be dewormed twice a year up to two years of age. The adult stock of animal is typically treated twice — once before the monsoon and once during the monsoon season (Khan et al 2009).

The chemicals used commonly are:

Piperazine salt is given at 0.2–0.4 g/kg body weight in cattle and buffalo, and 4–8 g/kg in sheep and goats, mixed in drinking water. It is most effective against ascarid worms. **Hexachloroethane** is used at 1–3 g/kg in pigs and 0.2–0.25 g/kg in cattle and buffalo, administered by stomach tube or as a suspension, and is effective against flukes and nematodes.

Carbon tetrachloride is given as a drench at 1–5 ml in cattle and 1–3 ml in sheep, and is effective against liver fluke.

Hexachlorophene is used at 1.5–2 g per 100 kg body weight by drenching or stomach tube against roundworms and tapeworms (Sastry & Thomas, *Livestock Production Management*).

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Published 30/10/2026

It is important to remember that deworming should be completed **before vaccination**. The reason is that the immune system of dewormed animal will respond to its full potential after administration of particular vaccine (Krishi Jagran, *Sheep and Goats: Winter Disease Management and Prevention Tips*, 2024).

Vaccination: Building the Body's Defenses

Vaccination is the practice of artificially building up immunity in an animal's body against infectious diseases using biological agents called vaccines (Sastry & Thomas, *Livestock Production Management*). A vaccine introduces an antigen — which may be live, attenuated, or dead bacteria, fungi, or viruses. The body of animal develops antibodies based on the type of antigen administered through vaccines and generates antigen antibody reactions and creates memory of antigen in case if exposure occurs next time. In response to this reaction, the body produces antibodies, usually within **14 to 21 days** after administration. This prepares the immune system to fight off the real pathogen if the animal is later exposed (WOAH, *Animal Health Educational Toolkit*).

Vaccination for Calves

Calf mortality under one month of age is about 10% in dairy herds and can range from 3% to 30% in individual herds. In large herds, losses may reach 50%. The main reason of mortality in such case is the overcrowding and lack of colostrum feeding to the calf. The other reasons include poor nutrition and adverse climatic conditions (Sastry & Thomas, *Livestock Production Management*).

Calf scours is a major killer. Three popular vaccines are available. **ScourBos 9®** is administered early in pregnancy when colostrum is being formed, and is given to heifers. **Guardian®** is another option. **Scour Guard 4KC®** is given late in gestation. These vaccines work by stimulating the dam to produce antibodies that are passed to the calf through colostrum (Stěpánek J, et al., *Vet Med (Praha)*, 1987; Crouch CF, *Vaccine*, 1985).

For **calf paratyphoid**, a vaccine is given subcutaneously. Calves receive 2 ml at 15 to 30 days of age. Cows in gestation receive 5 ml, vaccinated 30 days before birth, with annual revaccination (Mensík J, et al., *Vet Med (Praha)*, 1989).

Vaccination for Cattle and Buffalo

Anthrax vaccine is given at 1 ml subcutaneously once a year before the monsoon season and is effective for one year. Annual vaccination is continued for three years (Government of India, *Livestock Health & Disease Control Programme*).

Black Quarter is prevented with a polyvalent vaccine given between six months and two years of age, or to calves at three weeks of age. The vaccine is formalin-killed, and alum-precipitated versions are also available (Sastry & Thomas, *Livestock Production Management*).

For **Haemorrhagic Septicaemia (HS)** , three options exist. The killed HS vaccine provides immunity for more than one year. The oil adjuvant vaccine is given intramuscularly at 2–4 ml and gives immunity for about six months. The alum-precipitated vaccine is given subcutaneously and provides immunity for five months (Sotoodehnia A, et al., *Archives of Razi Institute*, 2005).

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Brucellosis is controlled with Brucella abortus strain 19 vaccine, given to all heifers between six months and one year of age, subcutaneously. Young animals are revaccinated after parturition (Alton GG, et al., *PubMed*, 1984).

Foot-and-Mouth Disease (FMD) is prevented with a killed polyvalent vaccine given at six months of age, followed by a booster four months later. For zebu cattle, caprinised vaccine is used at 1 ml subcutaneously every three years. For exotic and crossbred animals, lapinised avianised vaccine is given at six months, followed by revaccination after one year (Government of India, *Livestock Health & Disease Control Programme*).

Vaccination for Sheep and Lambs

Enterotoxaemia is a serious disease of sheep. A "three-way" vaccine is given subcutaneously. Bucks are vaccinated once a year. Lambs are vaccinated at eight weeks of age, followed by a booster 21 to 28 days later. Alternatively, lambs can be vaccinated at two weeks of age with a booster 21 to 28 days later (Figueras et al 2010).

Vaccination for Swine

Leptospirosis is a major disease of pigs. The vaccine **Lepto-Eryvac®** is given at 2.5 ml subcutaneously. Pigs are vaccinated twice before being allowed to enter the herd. The primary vaccination consists of a first dose at weaning (four weeks of age) and a second dose four to six weeks later. Revaccination is done every six months to maintain immunity. Breeding females should receive a booster about one month before farrowing (Jacobs et al 2015).

Conclusion

A healthy animal, especially a young one, is the pillar of livestock production. The guiding principle is simple: **prevention is better than cure** (Sastry & Thomas, *Livestock Production Management*). Every young animal should receive **colostrum** within the first hours of life, as it provides essential antibodies and energy. If a disease outbreak occurs, affected animals should be **segregated** immediately. **Footbaths with disinfectant** should be placed at farm entry points. A **quarantine period** must be observed for any animal brought in from outside. Finally, **proper disposal** of dead animals is essential to prevent the spread of disease (WOAH, *Animal Health Educational Toolkit*).

Deworming and vaccination are not expenses — they are investments. When done correctly and on schedule, they protect the herd, the farmer's income, and the future of the farm.

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