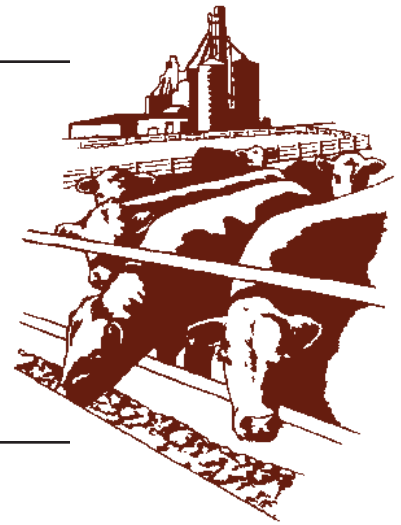


Beef Cattle Handbook



BCH-3000

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Vital Signs in Animals: What Cattle Producers Should Know About Them

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Disease may be defined as "any abnormal structural or functional change in the tissues of the body." Though diseases have many direct and indirect causes, such as trauma (wound or injury), parasites, congenital (present at birth), viruses, and others, they all affect to some degree the vital signs of the body. In animal physiology, the term "vital signs" pertains to the temperature, respiration rates, and pulse of the body. Obviously, there are other important functions in the body, but these three are fundamental for the maintenance of life. Without them all else is secondary.

Animal owners need not only to recognize changes in the condition and appearance of their animals, but also to learn to what extent an abnormality may be reflected in the vital signs of the body. Usually, the first signs of disease are slight and may go unnoticed. The observant individual who detects the early symptoms and initiates the proper action can play a big role in disease control. The vital signs of the body, what they might mean and how they may aid the stockman in describing symptoms to the veterinarian, are described in the following.

Temperature

Temperature is defined as "the degree of heat of a living body." An animal's temperature is actually the result of the balance between heat produced by the basal metabolism¹ and muscular activity of the body, and the heat lost from the body. Approximately 85 percent of heat loss is through the skin, the remainder is lost by the lungs and through digestive and urinary secretions. The actual regulation of body temperature is accomplished mainly through thermoregulatory centers located in the brain.

An animal's abnormal temperature may play a part in

the veterinarian's ultimate diagnosis of a disease, and the visual symptoms of abnormal temperature are often the first noticeable clue the owner may detect. When an animal's temperature is above normal limits, it's considered to have a fever; if it's below normal, it's called hypothermia. Domestic animals do not have constant normal temperatures and considerable variations will be found in the temperature of normal animals under different conditions. In general, animal temperatures will vary, depending on physical activity, stage of pregnancy, the time of day, and environmental surroundings.

In the United States, body temperature is measured with a clinical Fahrenheit thermometer. The thermometer has a scale ranging from 94° to 200°F, and each degree is divided into fifths. The procedure for taking an animal's temperature is: (a) shake the mercury column into the bulb end of the thermometer; (b) moisten or lubricate the tube; and (c) insert the bulb end through the anus into the rectum. Insert the full length of the tube into the rectum, and leave the thermometer in the rectum for about 3 minutes. Note: Most animals object to insertion of the thermometer in the anus, so be sure to use an appropriate restraint on the animal. The normal temperatures for different animals are as follows:

Species	Degrees Fahrenheit
Horse	99.5 to 101.3
Foal	99.5 to 102.2
Cattle	100.4 to 103.1
Sheep and goats	102.2 to 104.9
Swine	100.4 to 104.0

When the body temperature increases by at least 1°F over the normal upper limit, the animal is considered to have a fever. In most fevers, the temperature usually rises rapidly, reaches a peak, and then falls to a lower level. Generally, the height of the temperature indicates the height of the fever. Four categories of fever are distinguished here:

	Degrees Fahrenheit	
	Horse	Cow
Mild fever	101.3-103.0	103.1-104.6
Moderate fever	103.0-104.8	104.6-105.8
High fever	104.8-106.0	105.8-107.0
Very high fever	106.0-110.0	107.0-110.0

Usually the temperature never exceeds 106°F in horses or 107°F in cows—even in severe infectious diseases. However, in all animals suffering from heat stroke, the temperature may exceed 110°F.

Although the measurement of temperature is one of the most characteristic and reliable methods to judge the degree of fever, it does not always have a direct relationship in animals, especially in cattle. You must also consider other symptoms, such as chill, uneven distribution of the external temperature, pulse and respiration rates, appetite, digestion, morbidity, etc.

Subnormal temperature (hypothermia) may or may not indicate disease. It occurs in a variety of ailments, such as chemical poisoning, indigestion, and calving paralysis. Subnormal temperatures are much less frequent than fever temperatures.

Pulse

The pulse may be defined as “the rhythmic, periodic thrust felt over an artery in time with the heartbeat.” The important factors to note in taking the pulse are: (1) frequency, (2) rhythm, and (3) quality. Frequency is determined by counting the number of heartbeats occurring in one minute. Rhythm typifies a normal pulse seen in a series of rhythmic beats that follow each other at regular intervals. Quality is best described as the tension on the arterial wall; it is an indication of the volume of blood flow.

The pulse can be palpated (touched with fingers) in superficial arteries when they are in soft tissue and can be pressed against a hard or bony structure. When you have located an artery, hold it steady with the fingers and apply gentle pressure. To determine the rate accurately, count the pulse for one full minute. Judge the rhythm and quality by alternating pressure on the artery for another full minute.

The pulse in cattle and horses can be felt in approximately the same location: where the external maxillary artery crosses the lower edge of the mandible, just in front of the masseter muscle (Fig. 1).

When you place your fingers flat on the cheek in front of the masseter muscle and move them back and forth, you can easily feel the artery. In horses, pulse may also be taken on the inside of the forearm (radial bone)

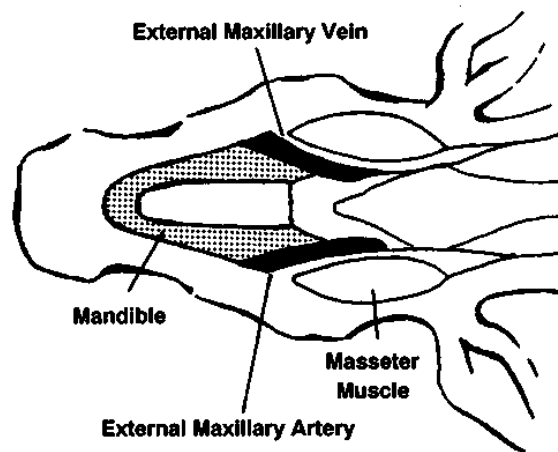


Fig. 1. Ventral view showing location of the external maxillary artery in cattle.

where the radial artery travels down the bone. In sheep and goats, the saphenous artery, which runs down the inside of the hind leg, is the most accessible location. In swine, the pulse cannot be felt at all. With this animal, the heart itself must be palpated directly.

The normal pulse frequency varies in different species and individual animals. Age, size, sex, breed, atmospheric conditions, time of day, exercise, eating, and excitement are all factors that influence variations in the pulse rate. The average pulse frequency, or the normal pulse rate, for large domestic animals is:

	Heart beats per minute
Adult horses	28 to 40
Newborn foals	100
Foals (6 to 12 months)	45 to 60
Cattle	40 to 70
Sheep and goats	60 to 90
Swine	60 to 100

The terms used to define pulse frequency are frequent (quick or rapid) and infrequent (slow).

Respiration

Respiration is the act of breathing, or more specifically, the acts of taking in oxygen, using it in the body tissues, and giving off carbon dioxide. The respiratory system is frequently subjected to primary and secondary disease, so stock owners must consider the area affected when an animal is not normal. A long list of serious diseases that affect all classes of farm animals eventually spread and settle in areas of the respiratory system.

In observing the respiratory system of an animal, begin at the nostrils and work rearward. Note anything abnormal in respiration, breath, nasal discharge, nasal cavities, sub-maxillary lymph nodes, cough, larynx and trachea, surface of thorax (chest), and auscultation of thorax (sounds in chest). Although the average stock owner is neither trained nor equipped to examine all these areas, he can make some intelligent observations concerning many of them.

Respiration consists of (1) inspiration, or the expansion of the chest or thorax—the part of the body between the neck and abdomen containing the heart and lungs; and (2) expiration, or the expulsion of air from the lungs. In examining respiration in an animal, check movement and sound at the nostrils and in the chest area. Give attention to the following factors:

- a. Rate –number of inspirations per minute.
- b. Depth – the intensity or indication of straining.
- c. Character – normal breathing involves an observable expansion and relaxation of the ribs (costa) and abdominal wall. Any interference in breathing that may show more or less effort in either of these areas affects the character of the breathing.
- d. Rhythm – change in duration of inspiration and expiration.
- e. Sound – normal breathing is noiseless except when the animal is exercising or at work. Snuffling, sneezing, wheezing, rattling, or groaning may indicate something abnormal.
- f. Dyspnea – labored or difficult breathing.

Variations in rate of respiration can be caused by many factors including body size, age, exercise, excitement, environmental temperature, atmospheric conditions, pregnancy, and fullness of the digestive tract. If variations in respiration rates are encountered and environmental conditions are suspected as being a possible cause, it's a good idea to check the rate of two or three other animals for comparative purposes. The normal range in respiratory rate in mature animals at rest is:

Horse	8 to 16 per minute
Beef cow	10 to 30 per minute
Dairy cow	18 to 28 per minute
Sheep and goat	12 to 20 per minute
Pig	8 to 18 per minute

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