Bovine physical examination

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Abstract
The physical examination is the foundation of the diagnostic workup in cattle. The physical exam begins with a distance exam where the animal is observed prior to restraint where parameters such as mental status, abdominal contour and lameness are best evaluated. With completion of the distance exam, the hands-on examination begins. It has been said that you miss more by not looking than by not knowing. For this reason, a systematic physical examination in which the examining veterinarian follows a standard pattern for every animal examined is to be followed.

Key words: exam, physical, bovine

Structure of the physical exam
My personal habit is to examine ruminants topographically rather than by body system. My evaluation always starts with evaluation from a distance for mental status, abdominal contour and conformation/stance/ambulation. For the hands-on examination, I work starting at the left shoulder, progressing down the left side, working at the back end, moving up the right side caudal-to-cranial and ending with the head and neck. This helps ensure that I don't miss anything and also facilitates efficiency of movement around a large animal and equipment.

Temperature, pulse, respiration, rumen motility
The backbone of the physical exam in monogastrics is the TPR. In ruminants, the backbone is the TPRR, to include rumen motility. The eyes are the window to the soul, the rumen is the window to the whole animal. Rumen motility is ausculted in the left paralumbar fossa, the triangle bordered by the 13th rib, the transverse processes and the flank fold. The rumen should be ausculted for a full 2 minutes and a good, strong movement will displace your hand away from the center of the animal and slowly fall back in. The rumen should also be palpated through the body wall to determine the character of the contents. A normal rumen has a small gas cap dorsally, a firm, depressible fiber mat below that, and then fluid in the ventral sac. Absence of a fiber mat indicates a prolonged period of anorexia and sloshy, liquid contents may indicate the same and is also seen with carbohydrate overload cases.

Palpation of lymph nodes
Lymph nodes that may be palpated externally on cattle include prefemoral (on the body wall cranial to the quadriceps), prescapular (at the juncture of the scapula and neck), popliteal (caudal aspect of the stifle), parotid (just caudal to the ramus of the mandible and below the ear), submandibular (palpated in the intermandibular space), deep retropharyngeal (palpated intraorally or by deep external palpation) and supramammary (located in the root of the udder). By rectal exam, internal iliac (craniodorsal to the body of the ileum) and sublumbar lymph nodes (at aortic bifurcation) may be palpated.[1] Lymph nodes provide clues about the status of organs in that region and may sometimes be the first clue that there is an active inflammatory process there. Where multiple lymph nodes in multiple regions are enlarged, bovine lymphoma should be included on a differential diagnosis list.

Jugular pulses
Depending on the style of chute used, it can be challenging to examine the jugular veins. Ideally, they will be visualized with the animal at normal head carriage before they are placed in the chute. In the absence of that, the animal should be pushed forward with as much of the neck extending beyond the front of the head gate as possible, and a little pressure released on the neck to allow normal blood flow. The presence of jugular pulses with distension of the vein is suggestive of right heart failure. In long-haired beef animals, this may be hard to see. To confirm abnormal distension, the jugular vein can be occluded at the midcervical region. In the normal animal, the jugular vein will fill above the occlusion and collapse below. In an animal with true distension of the vein, the collapse below the occlusion will be significantly delayed or will not occur.

Abdominal contour
Abdominal contour, like rumen motility, is a great indicator of an animal's overall status. It is best evaluated by looking at the animal from behind, a few feet away. The abdomen should be slightly wider at the bottom and the paralumbar fossae should not be overly sunken. Some common abnormal abdominal contours include very sunken flanks (usually from anorexia), "pear-shaped": bilateral ventral distension (seen with ruptured urinary bladder or late gestation), "apple-shaped": left sided distension both dorsally and ventrally (rumen distension or bloat) and "papple-shaped": dorsal and ventral distension on the left (apple) and ventral distension on the right (pear) (indicates vagal indigestion syndromes to include failure of eructation, omasal transport failure, pyloric outflow obstruction). Note: worsening or severe rumen distension is an absolute emergency. Once recognized, it should be relieved by whatever means possible as respiratory distress and failure can occur from increasing abdominal pressure. If passage of a stomach tube is unsuccessful, immediate trocarization or rumenostomy is indicated and the examination completed after deflation.

Percussion and succussion
Percussion and succussion are used to identify fluid and gas interfaces in the body. They are most commonly used in the abdomen to localize distended portions of the GI tract, but conditions such as pleuritis may also produce a fluid-gas interface.

Percussion is performed by gently and acutely striking the body wall with simultaneous auscultation with a stethoscope. Where a fluid-gas interface is present, a resonant pinging will be heard, which is almost always abnormal. Depending on the location of the ping, this may indicate prolonged anorexia and a lack of fiber mat in the rumen, a displacement and

Table 1: Structure of the physical exam

Left forelimb region	Left abdominal region	Left hindlimb region
Neck	Umbilicus	Left prefemoral lymph node
Jugular furrow	Penis, prepuce	Limb, hoof
Left prescapular lymph node	Rumen motility	Mammary gland
Limb, hoof	Percuss, succuss abdomen	Popliteal lymph node
Heart	Ballotte	
Lungs		
Brisket		

Rear	Right hindlimb region	Right abdominal region
Abdominal contour	Right prefemoral lymph node	Percuss, succuss abdomen
Limb conformation	Limb, hoof	Ballotte
Perineum, tail	Mammary gland	
Temperature	Popliteal lymph node	
Vulvar mucus membranes		
Supramammary lymph nodes		
Mammary gland		
Scrotum		

Right forelimb region	Head	Rectal exam
Heart	Facial symmetry	Rumen
Lungs	Parotid lymph nodes	Internal iliac lymph nodes
Brisket	Mandible	Sublumbar lymph nodes
Right prescapular lymph node	Submandibular lymph nodes	Cecum
Limb, hoof	Nose	Small intestine
Neck	Ears	Peritoneum
Jugular furrow	Eyes, sclera	Penis
	Oral Exam	Seminal vesicles, prostate
	Teeth	Uterus, vagina, cervix
	Mucosa	Inguinal rings
	Tongue	Left kidney
	Deep retropharyngeal lymph nodes	Urinary bladder

distension of the abomasum, intestinal distension with gas, or pneumoperitoneum.

Succussion involves using the fist to vigorously shake the abdomen in order to confirm the fluid-gas interface. Where one exists, splashing will be heard on simultaneous auscultation.

Grunt and withers pinch tests

These tests indicate the presence of caudal thoracic or cranial abdominal pain. Pleuritis, peritonitis and other painful conditions of these regions can cause an animal to exhibit pain with these tests. I prefer to avoid terminology such as "positive" or "negative" when reporting the findings of these tests because it can be confusing – is it positive because they grunted or negative that they grunted because that's bad? I prefer to report findings as "they show evidence of pain", "they grunted" or "they ventroflexed".

The grunt test is a two-person job, one to provide the stimulus and the other to auscultate the trachea with a stethoscope. Some sources refer to striking the xyphoid with either a knee

or a fist, both of which are difficult to do in a traditional chute, but may be performed in headlocks. I prefer to use a steel bar inserted into the chute over a chute rail, and then passed under the xyphoid. The bar should then be used as a lever to put pressure on the xyphoid. Normal animals will not respond other than perhaps to shift their weight. Animals with regional pain will grunt, audible through the trachea.

The withers pinch test may be performed by 1 or 2 people. As for the grunt test, simultaneous auscultation of the trachea can be helpful but is usually not necessary. The examiner uses both hands to provide rapid downward "pinching" pressure directly to the withers. A normal animal will ventroflex to avoid the stimulus. An animal with regional pain will avoid ventroflexion because ventroflexion would be painful. They may also grunt or hold their breath.

References

1. Terra RL, Reynolds JP. Ruminant history, physical examination, welfare assessment, and records. In: Smith BP (Ed.), Large Animal Internal Medicine 2020; St. Louis, MO: Elsevier.

