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DESCRIPTIVE OSTEOLOGY OF THE THORACIC LIMB OF BOVINE

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SUMMARY

The osteology of the bovine thoracic limb is fundamental to understanding the functionality and health of these animals. The thoracic limb, composed of bones such as the scapula, humerus, radius, ulna, carpal bones, metacarpals and phalanges, plays a crucial role in locomotion, support and execution of several activities essential for the survival and productivity of cattle. The scapula indirectly connects the limb to the trunk, providing a base for the insertion of muscles that facilitate movement. The humerus, being the long bone of the arm, is vital for the strength and mobility of the limb. The radius and ulna form the forearm, allowing flexion and extension movements necessary for walking and running. The carpal bones, metacarpals, phalanges and sesamoid bones make up the structure of the wrist and fingers, essential for stability and distribution of body weight. The health and integrity of the bones of the forelimb are essential for the well-being of cattle. Osteological problems, such as fractures, osteoarthritis or deformities, can compromise locomotion, causing pain and reducing the ability to graze and feed, which directly affects the animal's productivity. Furthermore, efficient locomotion is crucial for reproduction, allowing cattle to move freely in search of mates and resources. Although this information is widely found in books, there is a scarcity of scientific articles that address bovine osteology in detail. Therefore, this article aims to describe the bones of the bovine forelimb, providing a more accessible reference for professionals in the field.

Key words: Anatomy. Bovine. Arm. Bone.

ABSTRACT

The osteology of the thoracic limb of cattle is fundamental to understanding the functionality and health of these animals. The thoracic limb, composed of bones such as the scapula, humerus, radius, ulna, carpal bones, metacarpals, and phalanges, plays a crucial role in locomotion, support, and the execution of various activities essential for the survival and productivity of cattle. The scapula indirectly connects the limb to the trunk, providing a base for the insertion of muscles that facilitate movement. The humerus, being the long bone of the arm, is vital for the strength and mobility of the limb. The radius and ulna form the forearm, allowing the flexion and extension movements necessary for walking and running. The carpal bones, metacarpals, phalanx
ges, and sesamoid bones make up the structure of the wrist and fingers, essential for stability and weight
distribution. The health and integrity of the bones of the thoracic limb are essential for the well-being of
cattle. Osteological problems, such as fractures, osteoarthritis, or deformities, can compromise locomotion,
causing pain and reducing the ability to graze and feed, which directly affects the animal's productivity. Additionally, efficient locomotion is crucial for reproduction, allowing cattle to move freely in search of partners and resources. Although this information is widely found in books, there is a scarcity of scientific articles that detail the osteology of cattle. Therefore, this article aims to describe the bones of the bovine thoracic limb, providing a more accessible reference for professionals in the field.

Keywords: Anatomy. Beef. Arm. Cap.

1. INTRODUCTION

The skeleton of domestic animals plays a crucial role in supporting, protecting and moving the body, among other functions. It is composed of a complex network of interconnected bones that form the basic structure of the body and provide attachment points for muscles, tendons and ligaments. In general, considering the topography, the skeleton can be divided into two main parts: the axial and the appendicular. The axial skeleton includes the bones that form the central axis of the body, that is, the skull, spine, ribs and sternum. The appendicular skeleton is made up of the bones of the fore and hind limbs, including the shoulder and pelvic girdles. This skeleton is called this because it constitutes the main appendages of the animal's body, which are the limbs. In anatomical terms, the front paw is the thoracic limb and the back paw is the pelvic limb.

In domestic animals, the thoracic limb does not have a direct bony connection with the axial skeleton. In other words, it is different from primates, such as humans, which have a collar bone or clavicle that connects the scapula to the sternum. Instead, the thoracic paws support the body's weight by an arrangement of muscles and tendons. Some animals, such as dogs and cats, may have a small remaining clavicle embedded in a tendon in the shoulder region, but this also does not articulate with the axial skeleton, being of little or no clinical significance.

The bones of the thoracic limb of domestic animals include the scapula, which indirectly connects the limb to the trunk; the humerus, which is the long bone of the arm; the radius and ulna, which form the forearm; the carpal bones, which make up the wrist; the metacarpals, which make up the hand; and the phalanges, which form the fingers, in addition to the sesamoid bones. These bones work together to provide support, flexibility, and movement to the forelimbs, allowing for a wide range of essential activities. In this context, the objective of this work is to describe the bones and anatomical details of the bovine thoracic limb.

2 THEORETICAL FRAMEWORK

2.1 Scapula

The word “scapula”, also formerly called “omoplata” which means “shoulder plate”, derives from the Latin “scapula” with influences from ancient Greek, in which “skaphe” means “shovel” or “shell”, reflecting the shape flat and wide of the bone.

Therefore, the scapula is a triangular and flat bone, and is therefore classified morphologically as a flat or flat bone. It plays a crucial role in the anatomy of domestic animals as it is an integral part of the shoulder girdle. Located over the upper region of the back, the scapula connects the front limbs to the trunk, providing a solid base for the articulation of the limbs. Its structure is adapted to support the insertion of various muscles, tendons and ligaments, which are essential for the mobility and strength of the forelimbs.

Since the scapula is a triangular bone, it has three margins or edges, called the cranial, caudal and dorsal edges, in addition to three angles (“tips”), the cranial, caudal and ventral angles.

A cranial edge of the scapula is the anterior margin, it is thin, curved and “sharp”, extending from the cranial angle to the glenoid cavity. Already the caudal edge is the posterior margin, thicker, robust and straight, which extends from the caudal angle to the ventral angle, providing insertion points for muscles, such as the ventral serratus muscle. In turn, the dorsal edge, or base of the scapula , is the upper margin, which extends from the cranial angle to the caudal angle and is often thick and rounded.

O cranial angle is the junction point between the cranial and dorsal edges of the scapula and is characterized by a smooth, rounded curvature, while the caudal angle is the junction point between the caudal and dorsal edges of the scapula and is characterized by a more accentuated, acute, robust, prominent and triangular curvature.

gular. Already the ventral angle is the “tip of the triangle”, which is the point of articulation between the scapula and the humerus.

In addition to inter-species differences, the scapula has several notable anatomical characteristics, reflected in its varied anatomical features. These are distributed on two different surfaces, because, as the scapula is a flat, or flat, bone, it has two faces or surfaces: the side face , which presents, among other anatomical details, the spine of the scapula; and the medial face , or also called the costal face, as it lies on the ribs, and is therefore smooth and concave.

On the lateral face, the most notable anatomical feature is the scapular spine, a longitudinal bony prominence, similar to a blade, that extends along this entire surface, dividing it into two distinct regions, the supraspinatus and infraspinatus fossae. This structure serves as an insertion point for muscles

important and is palpable externally.

In its middle to proximal third, the scapular spine is interrupted by a rough eminence, called the tuberosity of the spine of the scapula or tuberosity of the spine .

An extension of the spine of the scapula is theacromion , a bony projection that, in some species, articulates with the clavicle (when present), but not in cattle, as they do not have a clavicle, being just another point for the insertion of muscles. Unlike other species, such as canines and felines, the bovine acromion has no curvature, forming only a straight tip.

As mentioned previously, the spine of the scapula divides the lateral surface of this bone into two distinct regions, which are the fossae. Therefore, cranially the spine issupraspinatus fossa , a depression that houses the supraspinatus muscle. The fossa receives its name because in an anatomical position the scapula is positioned at an angle, almost horizontal, which is why the supraspinal fossa, despite being cranial, will be located above the spine.

Already theinfraspinatus fossa is located caudal to the spine; or, once again, considering the almost horizontal position of the scapula when the animal is in an anatomical position, this fossa is below the spine, justifying its name. This depression accommodates the muscle of the same name, that is, the infraspinatus muscle.

At the end of the spine and fossae, there is a narrow region, calledneck of the scapula and which connects the blade or main body of the scapula to its distal end, that is, it is a transition point between the wider, more robust and flatter body of the scapula and the place where the articulation occurs with the next bone of the thoracic limb.

The cavity located at the distal or ventral end, below the neck, where the scapula forms the “point” of a triangle (since it is an almost triangular bone), is called theglenoid cavity , a shallow depression that articulates with the head of the humerus, forming the shoulder joint, also known for this reason as the glenohumeral joint and is essential for the wide range of movements of the forelimb.

Cranially to the glenoid cavity is thesupraglenoid tubercle, which gets its name because it is also above this cavity. This tubercle is a rough and important bony prominence because it is a strategic point, just above the joint between the scapula and humerus, for anchoring muscles and tendons, such as the tendon originating from the biceps brachii muscle, which plays a fundamental role in movement. elbow and stabilizing the shoulder joint. Despite not having any etymological relationship, the tuberabove glenoid and fossaabove spine are located in the same direction, facilitating their identification.

On the medial or costal surface of the scapula, there is thesubscapular fossa which is a wide and concave depression, with a generally smooth surface, and which serves to accommodate the subscapularis muscle. In different species of domestic animals, such as dogs, cats, cattle and horses, the subscapular fossa may vary slightly in shape and depth, but its essential function remains the same.

Still on the medial surface of the scapula, there is theserratus face , a specific area where some of the serratus muscles are inserted. This region is characterized by a series of roughness or oblique lines that provide a robust anchoring surface for these muscles.

Finally, thecoracoid process is a small, short and robust bony projection, located on the medial surface of the scapula, “behind” the supraglenoid tubercle and close to the glenoid cavity. Although its shape and size may vary between different species, its essential function remains consistent, serving as an insertion point for ligaments and muscles, such as the coracobrachialis muscle, assisting in thoracic limb movement.

2.2 Humerus

The word “humerus” comes from the Latin “humerus” which means “arm bone” or “shoulder”. The origin of the term may be related to the ancient Greek “ōmos” which means “shoulder”.

The humerus is the long bone in the proximal part of the thoracic limb; is the arm or brachial bone. It extends from the shoulder to the elbow and is fundamental to the structure and movement of the limbs, providing support and allowing a wide range of movement, depending on the species.

Since the humerus is a long bone, it has three main parts: the proximal and distal epiphyses. such, and the diaphysis. Aproximal epiphysis is the upper end of the bone, which articulates with the scapula to form the shoulder joint. Already thediaphysis is the long, central part of the humerus, located between the proximal and distal epiphyses. In turn, thedistal epiphysis is the lower end of the humerus, which articulates with the radius and ulna to form the elbow joint.

Furthermore, the humerus has four distinct faces/surfaces, namely: lateral, medial,

cranial and caudal. Aside face is the outer surface of the bone, while themedial face it is the internal one and is less prominent in terms of visible anatomical features. Already thecranial face of the humerus is the front surface, which faces towards the front of the animal, its head. In turn, thecaudal face , as its name suggests, is the part of the bone that faces the animal's tail, its rear surface.

In all its parts and faces, the humerus presents important anatomical structures, such as thehead which is a spherical structure, like a ball, located at the proximal and caudal end of the bone and which articulates with the glenoid cavity of the scapula, thus forming the shoulder joint, a joint classified as ball and socket type. The surface of the humeral head is covered by articular cartilage, a smooth and resistant layer that reduces friction during movement and absorbs impacts, preventing bone wear and facilitating smooth movements. Therefore, since the rounded morphology of the humeral head allows a wide range of movements, the articular cartilage and adjacent structures guarantee the stability and efficiency of the joint.

Immediately below the head, delimiting it, is thelap , also known as the anatomical neck, a narrow and constricted region that separates the head from the body of the humerus. It is an important transition point, as it is where several ligament structures and joint capsules that stabilize the shoulder joint are inserted.

Furthermore, also in the proximal epiphysis, adjacent to the head of the humerus, but on the cranial surface of the bone, are thegreater and lesser tubers , which are bony prominences important for the insertion of muscles.

Ogreater tuber is located laterally. Already thelesser tuber , in turn, despite also being in the proximal epiphysis of the humerus, is located medially. It is a bony protrusion and an important insertion point for the subscapularis muscle.

Between these tubercles, still at the proximal end of the humerus, is theintertubercular groove , an anatomical depression that serves as a channel for the passage of tendon and other anatomical structures towards the forearm.

Extending downward/distally is thebody , or diaphysis, the long, cylindrical portion of the humerus of domestic animals, with its smooth and slightly curved surface, located between the proximal end and the distal end of the bone. Internally, the body of the humerus contains a canal, called the medullary canal because it houses the bone marrow.

Despite its smooth surface, the body of the humerus, at specific points, presents prominences for the insertion of muscles, such as thedeltoid tuberosity , a bony protuberance located on the lateral surface of the body of the humerus, approximately in the mid-shaft region and which serves as an insertion point for the deltoid muscle, which is crucial for shoulder flexion. In all domestic species this tuberosity is evident, but it is much more developed in horses.

On the reverse surface, that is, on the medial surface of the body of the humerus, there is another bony protuberance, but much less prominent, visible as a roughness, calledgreater round tuberosity , which, as its name suggests, is an important point for the insertion of the teres major muscle, responsible, among other functions, for flexing the shoulder.

Descending towards the distal epiphysis is thecrest of the humerus , a longitudinal elevation that also serves as support for the insertion of muscles and ends at theradial fossa , a depression at the distal end of the humerus, above its condyle.

Therefore, in the distal epiphysis of the humerus, on the cranial surface, are the articular surfaces, collectively referred to as the condyle. Ocondyle of the humerus is the distal portion that articulates with the bones of the forearm, dividing into two main parts: the trochlea and the capitellum. Atrochlea is the medial articular surface, in the form of a pulley that articulates with the trochlear notch of the ulna. While thechapter it is the lateral surface, in a spherical shape that articulates with the head of the radius. Together, these structures allow the movement ment of the elbow.

On the caudal surface, but still in the distal epiphysis, is the olecranon fossa, a deep depression that accommodates the olecranon of the ulna during complete extension of the elbow, allowing a precise fit and facilitating the articulation between the humerus and the ulna.

Above the olecranon fossa, there is also the nutrient foramen, a small hole in the body of the humerus through which blood vessels and nerves pass, responsible for the nutrition and innervation of the bone tissue.

2.3 Radio

The name “radio” originates from the Latin “radius”, which means “ray” or “rod”. This denomination is

appropriate due to the elongated and straight shape of the bone, which resembles a wheel spoke or a stick. The term “radius” is also used in geometry to designate the line that goes from the center of a circle to its circumference, which reinforces the idea of a straight and elongated element.

The radius bone is one of the two long bones of the forearm, but it is the main bone in supporting the weight of this forearm region. It extends from the elbow to the carpus (wrist), playing a crucial role in the mobility and support of the forelimb. The radius articulates proximally with the humerus at the elbow and distally with the carpal bones, allowing flexion and extension movements as well as limited rotation of the forearm. In domestic animals, the structure of the radius is adapted to support load and facilitate locomotion, being more robust in species that require greater strength and stability in the forelimbs.

Being a long bone, like the humerus, the radius can also be divided into three parts: the two ends, called proximal and distal epiphyses, defined according to the distance with the axial skeleton; and thediaphysis , which is the central part, between the two epiphyses. Aproximal epiphysis is the extremity that has structures that articulate with the humerus, while thedistal epiphysis has structures that articulate with the proximal row of carpal bones. In addition, the radius also articulates with the ulna, laterally.

Regarding its surfaces, the radius also has four: the cranial and caudal surfaces, as well as the lateral and medial surfaces, the latter also called margins or lateral and medial edges. Acranial face it is smooth and facing forward; Thecaudal face it is rougher and faces backwards, where muscles and ligaments are inserted, in addition to having contact with the ulna; Themedial face is internally focused; while theface side turns outward.

At its proximal end, the radius has facets that articulate with the proximal end of the ulna and a large concave articular surface, where it joins with the distal end of the humerus. This articular surface of the radius that joins the humerus is called theradio head , forming the elbow joint. This structure is generally rounded and smooth, but not like the head of the humerus. She hasarticular foveae which are depressions where the distal articular surface of the humerus fits.

Located immediately distal to the head is theradio lap , a narrow region that connects the head to the body of the bone.

Close to the neck, on the cranial surface of the bone, is theradium tuberosity , a bony prominence that serves as an insertion point for muscles and ligaments, particularly important for the attachment of muscles essential for elbow flexion and stabilization of the limb during locomotion.

Continuing distally, theradio body is the elongated and central portion of the bone, located between the proximal end and the distal end.

At its distal end, the radius has several facets and a pointed process, calledtrochlea , a smooth, concave articular surface adapted to articulate with the bones of the proximal row of the carpus. In this region there may also be astyloid process , as well as the ulna, which also articulates with the carpus.

2.4 Ulna

The name “ulna” also comes from Latin, where “ulna” means “elbow” or “forearm”. In classical anatomy, “ulna” referred to the part of the arm that runs from the elbow to the wrist. The word may have even older roots, possibly deriving from the Greek (olene), which also means “elbow” or “forearm”. The ulna is one of the two long bones of the forearm, and its name reflects its anatomical position and function.

The ulna is a long, thin bone that, together with the radius, makes up the forearm. This bone extends along the radius, on the caudal surface and with a more lateral position, contributing to the formation of the elbow joint and playing an important role in transmitting forces during movement. Comparatively, the ulna is the main portion of the elbow joint with the distal end of the humerus.

In cattle, the ulna is partially fused to the radius, separated only by narrow interosseous spaces, which limits the rotation of the forearm, but provides greater stability and support for locomotion.

The most evident anatomical structure in the ulna is theolecranon , which forms the tip of the elbow, a robust and prominent structure, located at the proximal end of the bone, which projects dorsally, forming a powerful lever for the insertion of elbow extensor muscles, such as the triceps brachii muscle tendon. The olecranon fits into the fossa that receives its name in the humerus, at its distal end, on the caudal surface (the olecranon fossa), allowing flexion and extension movements.

At its proximal end, the olecranon has a rough protuberance calledolecranon tuberosity which also facilitates the fixation of muscles and other adjacent structures.

Still in the olecranon, thetrochlear notch, also called trochlear fovea, a concave articular surface, in other words, a crescent-shaped vertical curvature, located at the tip of the

proximal part of the ulna and which articulates with the trochlea of the humerus to form the elbow joint. This structure provides a smooth, congruent joint surface that facilitates smooth gliding between the bones during movement, while also making the joint secure and firm.

In the upper part of the trochlear notch of the ulna is theanconeal process , a beak-shaped bony prominence located specifically at the proximal end of the bone. This process projects upward and backward, fitting into the olecranon fossa of the humerus when the elbow is in full extension. The anconeal process plays a crucial role in the stability of the elbow joint, preventing hyperextension and contributing to joint congruity. Its position and structure help distribute the forces transmitted through the elbow, protecting the joint from injury and excessive wear.

Regarding yourbody , the ulna extends to the carpus in all common species except the horse. Its shape matches the straight or curved shape of the radius. In cattle and other species, the distal end of the ulna consists of a pointed process called thestyloid process , which articulates with the carpus.

Between the radius and ulna bones, one or moreinterosseous spaces , being called proximal or distal.

2.5 Carpus

The word “carpus” comes from the Greek “karpós”, which means “fist” or “fruit”. In anatomical context, it refers to the bones of the wrist. Therefore, the carpus of animals, also known as the “wrist”, is a complex structure made up of several small bones and joints that connect the forearm to the hand or paw. In mammals, the carpus is formed by two rows of bones: the proximal row and the distal row.

The carpal bones have at least four faces or surfaces: dorsal, palmar, lateral and medial. A dorsal side is the dorsal surface of the carpus, facing the animal's head, while thepalmar face it is the reverse surface, facing caudally and towards the ground. Aside edge is the outer margin of the carpus, facing outward from the limb, and themedial border is the inner margin, facing the center of the animal's body.

Considerable variety is seen among species in the precise formation of the carpus, but a basic naming convention remains across species lineages. Therefore, the bones in the proximal row have individual names, while the bones in the distal row are given numbers instead of names, counting starting on the medial side and continuing laterally.

Atproximal row The following bones are found:carpal radialis It isintermediate carpus (or scaphoid and lunate in humans), located in the medial part of the carpus, close to the radius; beyond the bonecarpal ulnar (or pyramidal in humans), located laterally, close to the ulna; and the bonecarpal accessory (or pisiform in humans), protruding backwards on the lateral surface of the carpus and which also articulates with the ulna.

In turn, in the distal row, the carpal bones vary in number and shape between different species, but generally include four main bones, individual or fused, which articulate with the metacarpals, namely carpal bones I, II, III and IV. .

In the distal row of the carpus, the bovine has the following bones: carpal II + III and carpal IV.

2.6 Metacarpus

In the hand, the bones are called metacarpals and depending on the animal species they can be single, double or multiple. The word “metacarpus” is formed by combining the Greek prefix “meta”, which means “beyond” or “after”, and “karpós”. Thus, “metacarpus” refers to the region “beyond the carpus”, that is, to the bones that are found between the carpus (wrist) and the phalanges (fingers). Therefore, the metacarpals are long bones that extend distally, lying between the bones of the distal row of the carpus (wrist) and the phalanges (bones that form the fingers). They are identified by numbers, starting from the medial side to the lateral side, with the thumb being metacarpal I, for example, in addition to metacarpals II, III, IV and V, present in some species, but not in all.

Therefore, in animals, the appearance of the metacarpal bones is largely determined by the type of paw the animal has. In cattle, the metacarpals are fused into a single bone, forming the “cannon bone”, which is a fusion of metacarpals III and IV, while metacarpals I, II and V are generally absent or vestigial in this species.

Aproximal epiphysis The metacarpus of cattle is the upper end that articulates with the carpal bones. A diaphysis , in turn, is the elongated and central part of the metacarpus, composed of compact bone, responsible for support and resistance. At the lower end, there is thedistal epiphysis , which articulates with the phalangeal bones.

Adorsal side is the dorsal surface of the metacarpus, facing the animal's head, while thepal face

sea it is the reverse surface, facing caudally and towards the ground. Aside edge is the outer margin of the metacarpus, facing outward from the limb, and themedial border is the inner margin, facing the center of the animal's body.

Due to the fusion between the metacarpal bones of cattle, in the center of the bone there are two grooves, demarcating where the division between the two bones would be, one on each surface, being called dorsal longitudinal groove (which is located on the dorsal surface) andpalmar longitudinal groove (the one located on the palmar side of the bone, facing the ground). Furthermore, twochannels where important structures pass: theproximal canal and thedistal canal , passing through the metacarpal bone of the bovine. The distal end is characterized by an articular surface with twotrochleae (onemedial and the otherside), divided by a intertrochlear notch .

On the distal surface of the horse, only onetrochlea which also has a central protuberance called thesagittal crest .

2.7 Phalanges

After the metacarpals, distally, are the fingers, which are each composed of three bones, called phalanges. Regarding etymology, the word phalanx derives from the Greek “phalanx”, which means “line of soldiers” or “row”, referring to the bones that make up the fingers and which are arranged in rows.

The phalanges are named according to their proximity to the body: they are theproximal phalanx , commonly called the long pastern bone, the one that articulates with the metacarpus; Themiddle phalanx , commonly called the short bone of the pastern, which is located in the middle of the other two; and thedistal phalanx , commonly known as the hoof bone, which is the furthest bone from the axial skeleton and which is covered by the hoof or has nails or claws, depending on the animal species.

Despite being small, most phalanges are considered long bones. Therefore, it is divided into proximal and distal epiphyses, in addition to the diaphysis. And it has four surfaces: dorsal, plantar, lateral and medial. Aproximal epiphysis The phalanx is the upper end of the bone, which articulates with the distal epiphysis of the metacarpal or with the anterior phalanx, depending on the position of the phalanx in the digital sequence. Adiaphysis The phalanx, or body of the bone, is the long, cylindrical portion that extends between the proximal and distal epiphyses. Already thedistal epiphysis The phalanx is the lower end of the bone, which articulates with the subsequent phalanx or with the distal end of the limb, depending on the position of the phalanx.

Adorsal side of the phalanx is the surface facing the animal's head or back, while thepalmar face is the surface facing the floor. The lateral and medial aspects of the phalanx are the outer and inner surfaces of the bone.

2.8 Sesamoids

Finally, the sesamoid bones of the thoracic limb of domestic animals are small bones that develop within tendons or ligaments, usually in places where these tissues pass over joints. They play a crucial role in reducing friction, increasing the mechanical efficiency of tendons and protecting them against excessive wear and tear. The word derives from the Greek “sesamon”, which means “sesame seed”, as ancient anatomists thought that the shape of sesamoids resembled sesame seeds.

The presence and function of the sesamoid bones are essential to the health and performance of the forelimbs, allowing smooth movement and protecting the tendon and ligamentous structures as they act as bearings on the joint surfaces to allow the muscles to exert powerful forces. in the bones without wearing out the tendons from the constant back and forth movement on the joint.

Sesamoids are also named according to their proximity to the body, being calledproximal sesamoids , those that are located closer to the trunk compared tosesamoids distal , which are located further away from the axial skeleton, but both in the region of the joints between the metacarpals and phalanges.

2. MATERIAL AND METHOD

This work consists of a narrative review of the literature on the bones and anatomical details of the bovine thoracic limb. The literature search was carried out in the PubMed, ScienceDirect and Google Scholar databases, using the following keywords: “Anatomy”, “Osteology”, “Bones”, “Arm”, “Thoracic limb”, “Bovine” and “Ruminant ”. However, although this information is widely available,

levels in books, there is a lack of scientific articles that deal in detail with the osteology of domestic animals, including cattle. Therefore, this article aims to describe the bones of the bovine thoracic limb, offering a more accessible reference for students and professionals in the field.

After selecting the studies, a critical reading and analysis of the contents was carried out, seeking to identify the main details related to the bones of bovine thoracic limbs. The information obtained was organized and synthesized to prepare this literature review.

3. FINAL CONSIDERATIONS

In conclusion, bovine forelimb osteology is crucial to understanding the functionality and health of these animals. Composed of bones such as the scapula, humerus, radius, ulna, carpal bones, metacarpals, phalanges and sesamoids, the thoracic limb is essential for locomotion, support and various vital activities. The scapula connects the limb to the trunk, while the humerus, radius and ulna ensure strength and mobility. The carpal bones, metacarpals and phalanges ensure stability and distribution of body weight. Osteological problems can compromise locomotion and affect cattle productivity. Given the scarcity of detailed scientific articles on the topic, which is found almost exclusively in books, this article aims to describe the bones of the bovine thoracic limb, offering an accessible reference for students and professionals in the field.

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