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MORPHOLOGICAL CRITERIA FOR ASSESSING THE HEART OF CATTLE (*BOS TAURUS TAURUS L.,* 1758)

МОРФОЛОГІЧНІ КРИТЕРІЇ ОЦІНКИ СЕРЦЯ ВЕЛИКОЇ РОГАТОЇ ХУДОБИ (*BOS TAURUS TAURUS L.,* 1758)

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The heart is the central organ of the cardiovascular system, ensuring continuous blood circulation, maintaining homeostasis and adaptive processes in the body [1]. Its morphofunctional state directly affects the level of productivity, reproductive capacity and duration of economic use of animals [2]. The anatomical and histological structure of the heart reflects both species characteristics and the influence of age, physiological and pathological factors.

In modern veterinary medicine, the issue of species identification of internal organs sold as by-products, as well as the detection of meat raw material falsification based on morphological characteristics, remains relevant [3]. The species of meat can be determined by a combination of morphological and organoleptic indicators, in particular by the colour, consistency, and smell of fatty and muscle tissues [4]. At the same time, the most objective and diagnostically valuable criteria are anatomical and morphological differences in the structure of parenchymal and tubular organs, which retain characteristic species features even after technological processing [5]. This fully applies to the heart as one of the important internal organs [6].

Cattle (Bos taurus taurus L., 1758) are one of the leading objects of animal husbandry, which necessitates a thorough study of their anatomical and morphological characteristics. Significant body weight, intense metabolism and high productivity place specific functional loads on the cardiovascular system, which necessitates a detailed morphological analysis of the heart of this animal species. Establishing morphological norm indicators is the basis for interpreting structural changes in various pathological conditions.

Morphological examination of the heart is important for forensic veterinary practice, as clearly defined criteria allow for objective assessment of pathological abnormalities, differentiation between ante-mortem and post-mortem changes, and determination of possible causes of sudden death in animals. In addition, the assessment of the structural condition of the heart is part of the veterinary and sanitary examination of slaughter products, as the changes detected may indicate systemic disorders, infectious or toxic damage to the body and influence the decision on the suitability of products for consumption.

Thus, the heart of cattle is an important object of morphological research, the results of which are of theoretical and practical importance for anatomy, pathomorphology, forensic veterinary examination, and veterinary and sanitary control.

The aim of the study was to establish morphological and morphometric indicators of the heart of cattle (Bos taurus taurus L., 1758) in a state of physiological norm with subsequent justification of their significance as

criteria for anatomical, clinical, forensic veterinary and veterinary-sanitary assessment.

The heart, as the central organ of the circulatory system, is characterised by a clearly organised spatial and structural architecture that ensures unidirectional blood flow and effective haemodynamics. Its anatomical features in cattle reflect species adaptations to significant body mass, intense metabolism, and high productivity.

In cattle, the heart is a four-chambered organ consisting of two atria and two ventricles connected by atrioventricular openings. Atrioventricular valves are located in the area of these openings: a bicuspid valve in the left half and a tricuspid valve in the right half, which ensure the directed movement of blood and prevent its reverse flow. The valve structures are fixed by tendinous cords attached to the papillary muscles of the ventricles, which stabilise the valve apparatus during systole.

In terms of shape, the heart is characterised as a cone-shaped organ with a dorsally oriented base and a ventrally directed apex. Topographically, it is located in the chest cavity between the lungs, cranially from the diaphragm, with a slight shift to the left. In projection onto the chest wall in the area of the 3rd–4th ribs, the heart contacts the left chest wall, and its apex reaches the level of the 5th costal cartilage.

The obtained morphometric indicators can be considered as criteria for physiological norm. The absolute mass of the heart is 2143.27±38.76 g, the relative mass is 0.43±0.006% of body weight. The net mass of the organ without epicardial fat is 1936.26±41.12 g. Linear parameters are characterised by the following values: height – 23.08±0.11 cm, width – 13.9±0.18 cm, thickness – 8.1±0.12 cm, circumference – 38.08±0.9 cm. The heart development (shape) index is 166.04±5.14%, which corresponds to an elongated-narrowed (cone-shaped) type of structure.

The morphological and morphometric indicators presented form a system of reference values for assessing the structural condition of the heart. They can be used as diagnostic criteria in the detection of hypertrophic, dilated or dystrophic changes in the myocardium, in forensic veterinary examination to differentiate between pathological and post-mortem changes, and in veterinary and sanitary practice when assessing slaughter products.

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