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Heart Failure in Calves

A frequent cause of death

H. H. Kingman, D.V.M.*

The causes of death in calves at the time of birth or soon thereafter have long been the subject of investigation. Bacterial diseases have received wide-spread attention, and recently nutritional deficiencies have been the object of research. Capable biological chemists have entered this field and are making fine contributions toward the solution of some of the diseases of the newborn encountered by the veterinary clinician. In this connection it should be pointed out that the calf loss at the time of parturition and during the succeeding weeks costs the livestock industry a terrific toll. It is said that as high as 20 percent of dairy calves do not reach maturity.

Autopsy Calves

Perhaps the problem has been given too little attention by the veterinary profession. I suspect that autopsies are seldom held upon calves born dead, or upon calves up to two or three weeks of age. It is also likely that our instruction in the matter of anatomy and physiology of the fetus and new-born calf has been given too little consideration. The clinician will find many things of interest in the dissection and examination of the mature fetus and baby calf.

The circulatory system as a whole deserves attention and it goes without saying, the heart is a vital organ. The detection of cardiac failure is of little practical significance, and so far as I know, little or nothing can be done to prevent it or to treat it after a diagnosis has been made. However, there is always a great satisfaction in determining the cause of death in spite of one's helplessness to prevent its recurrence. The examination of the heart should be a routine measure since cardiac failure of one kind or another has been encountered frequently.

Example

The following case is just one of many interesting examples of what may be called heart-failure. The subject was a nursing Hereford calf, 30 days of age, which had never enjoyed good health. Exercise caused more or less respiratory difficulty, and there was no attempt to play as young calves normally do. His appetite was fair, and he had not suffered from calfhood diarrhea, pneumonia or other debilitating diseases.

The mucous membranes were slightly cyanotic, there was an infrequent cough, the temperature was normal and bowel movements were normal most of the time. He made a nearly normal growth, but was in poor flesh. The calf was found dead and autopsy revealed nothing of particular interest except the lesions of the heart and lungs.

Gross Examination

Upon gross examination of the heart, dilatation was evidenced by its enlarged, flabby, and rounded shape. This was particularly evident at the apex of the heart where the normal conical shape had undergone dilatation almost to the point of presenting a flattened box-like appearance. No evidence of pericarditis was found on opening the pericardial sac, and the pericardial fluid was present in a

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physiological amount. The heart was opened by cutting just lateral to the median septum. The clotted blood was removed and the endocardium thoroughly washed. A patent foramen ovale was at once apparent. The lumen was well defined, circular in contour, and about the diameter of an ordinary lead pencil. There was no evidence of even an abortive attempt at the closure of the lumen.

**Ductus Arteriosus**

The question immediately came to mind as to the status of the ductus arteriosus. This was located and found to be in normal position passing from the pulmonary artery near its bifurcation to the arch of the aorta. This band of tissue was noted to be much larger than the ligamentum arteriosum which is found in the normal adult and which is a fibrous band formed by the normal closure of the ductus arteriosus. A probe was passed from the pulmonary artery through the ductus arteriosus into the aorta demonstrating that this embryonic structure was also patent.

Gross examination of the lungs revealed the right lung was almost atelectatic and fetal in character. This observation was substantiated by utilizing the floatation test. The left lung showed localized areas of pneumonia. These localized areas were of a size comparable to a kernel of corn, and were present on the surface and within the parenchyma of the lung. In all there were about 30 of these localized pneumatic areas. These pneumatic areas were cultured after searing the surface of the area to destroy any contaminants. Bacteriologic examination utilizing direct microscopic smears of pure cultures and biochemical tests demonstrated the etiologic agent to be Streptococcus uberis.

**Tissue Sections**

Tissue sections were prepared from both of the lungs and fixed in 10 percent formalin. These tissue blocks were sectioned and stained with hematoxylin and eosin. Microscopic examinations of the sections of the right lung substantiated the atelectatic finding. This lung was definitely embryonic in nature and had apparently remained entirely functionless.

Examination of sections of the left lung revealed areas of rather diffuse leukocytosis with polymorphonuclear cells predominating. These areas were rather well defined, but since the alveolar tissue was still intact the condition was diagnosed as chronic localized pneumonia rather than abscess formation. There was some inflammatory edema which was rather marked in the various intralobular septae. A review of the post mortem findings adequately explains the symptomatology presented.

The favorable action of riboflavin on the skin is illustrated by its use in the healing of cheilosis and bedsores in the human subject. Decubitus ulcers are treated with 5 mg. per day, administered orally. Even bedsores in dying patients respond to its action. Similar benefits are derived in corneal ulceration and vascularization.

In a test involving 640 turkeys and lasting 28 weeks, workers of the Bureau of Animal Industry, USDA, found that vegetable-protein diets produced as large turkeys as those fed a control diet, containing skim milk, meat scraps and fish meal. Soybean meal, peanut meal, and ground wheat were the main diets tested. Moreover, the tests showed that the cost was less.