

## 6. Summary

### **Comparative quantitative-morphological examination on hearts and lungs of layer-type and meat-type chicken at the age of seventh to fifty second day of life**

There is an increased disposition of insufficiency of the cardio-circulatory system for the meat-type chicken in comparison to the layer-type chicken. This becomes obvious through the frequent occurrence of sudden death syndrome and ascites syndrome among young meat-type chicken.

The objective of this study was to point out difference between both species of poultry referring to quantitative-macroscopic and microscopic examinations of the heart and its isolated parts as well as of the lungs. This could contribute to the explanation of the higher susceptibility to the insufficiency of the cardio-circulatory system among young meat-type animals.

The examinations were carried out in one group of layer-type chicken (White Leghorn) and two groups of meat-type chicken (Line Ross 208) with seventy chickens in each group, which was kept under the same commercial conditions and was fed with diets ad libitum. The feed for both the group of layer-type chicken and the first group of meat-type chicken was identical. It had lower energy content in comparison to the feedstuff for the second group of meat-type chicken. Thus a different development of body weight was caused by nutrition in both groups of meat-type chicken.

From the seventh day of age on every third or fourth days five chickens were taken out of either experimental animal group for the necessary examinations. They were killed after anaesthetization. After this the body weight of the chickens was ascertained and then their hearts and lungs were prepared in order to determine a multiplicity of macroscopic and histologic values of both organs.

Based on of the parameter of the heart and the lung, like for example *relative weight* of the heart and the lung and the single heart parts, *quotients from the heart*, *external* and *internal measurements of the heart*, the subsequent statements were considered as the most important differences between the layer- and meat-type chicken with a possible importance to the impairment of the cardio-circulatory function at the young meat-type animals : 1) Compared to young layer-type animals a remain behind of the growth of the lungs in proportion to body weight among young meat-type animals follows from the ascending increase of the body weight. This occurs especially in the first three to four weeks of age. 2) Though the growth rate of the heart among the layer- and meat-type young animals is similar, the slower growth development of the lung at the meat-type chicken leads to a displacement in the symmetry of the heart among these animals. 3) The growing increase of the body weight at the meat-type young animal lead to a growing functional demand on the atria and a stronger work load for the right heart (symptom of pulmonary high pressure). This can also influence the left heart. 4) Simultaneously an increasing occurrence of cell infiltrations in heart and lung and of cartilaginous and

osseous nodules in the lung reveals an increased pathological disposition of these organs among the meat-type young animals especially in the second meat-type animal group in comparison with the layer-type young animals.

The results show, that the lessening of the efficiency of the lung, as a constitutional factor of the meat-type chicken, leads to structural changes at the heart. These changes influence the efficiency and ability for the function of the heart negatively and thus they are able to contribute to an increased disposition of insufficiency of cardio-circulatory system.