



ISSN: 2456-2912  
VET 2018; 3(4): 22-23  
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www.veterinarypaper.com  
Received: 13-05-2018  
Accepted: 15-06-2018

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## Morpho histological study of the spleen of broiler chickens during post-hatching age

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### Abstract

The development of spleen during 10 weeks of age, realized on 88 broiler chickens (Hubbard F15) they permitted to collect information about the morphometric and histologic aspect of this organ according to their post-hatching age.

The evolution of spleen average weight peeked development at 7<sup>th</sup> week of age and inter in a stationary phase characterized by keeping its weight to 3, 7g until 8<sup>th</sup> weeks of post-hatching age. This histological variations are not in close relationship to the sexual maturity lake the thymus and the bursa of Fabricius. The weight pulp and red pulp are intermingled and there is no limit between two pulp. These results can be used in the diagnosis of different diseases such as Gumboro disease, Marek disease.

**Keywords:** Morpho histological study, spleen, post-hatching age, broiler chicken

### Introduction

Like mammals, birds lymphoid system is divided into two parts morphologically and functionally distinct: the primary lymphoid organs and secondary lymphoid organs <sup>[2]</sup>.

The immune system (lymphoid) in birds mainly differs from that of mammals by the presence of the bursa of Fabricius (equivalent to bone marrow in mammals) and the thymus. The secondary lymphoid organs include the bone marrow, mucosa-associated lymphoid tissue (MALT) and spleen without lymph nodes <sup>[1]</sup>.

The aim of our work is to study the morpho histological evolutions of the spleen of broiler chickens during post-hatching age.

### Materiel and methods

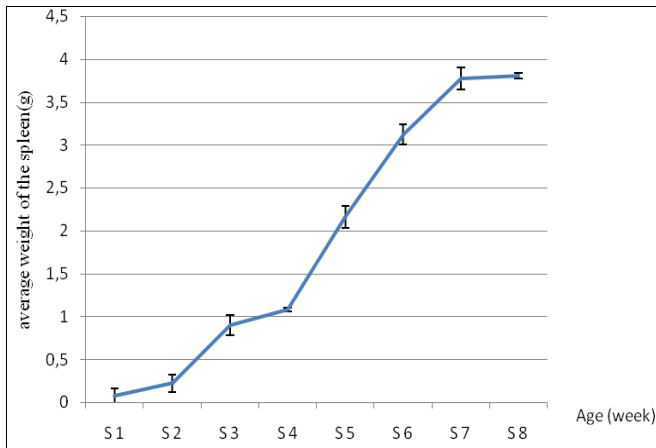
The experimental study was carried out on 88 subject of broiler chickens clinically healthy, a sample of 8 subjects were taken weekly randomly on a strip of 2000 subjects of broiler chickens (Hubbard F15). The study was performed in the histology laboratory, agro-veterinary institute, University of Souk Ahras.

The lymphoid organs collected have been a macroscopic and histological examination. The realization of blades for histological examination was made using the technique described: Tissues obtained from chickens were fixed in 10% formalin for 24 hours and then underwent successive passes through various compartments; dehydrated in increasing concentration of ethanol, cleared in xylene and finally soaked in paraffin. The histological structures of lymphoid tissues were observed using an optical microscope (low and high magnification) <sup>[4]</sup>.

### Results and discussion

#### Morphometric Study of The Spleen

The evolution of the average weight of the spleen during post-hatching age is shown in fig. 1, we note the existence of two phases: during the first phase, which runs from the first week to 7<sup>th</sup> weeks of post-hatching age. The spleen growth quick and fast (pass 0.1 g to 3.7 g), but from the eighth week, spleen enters a stationary phase characterized by keeping its weight to 3.7g.



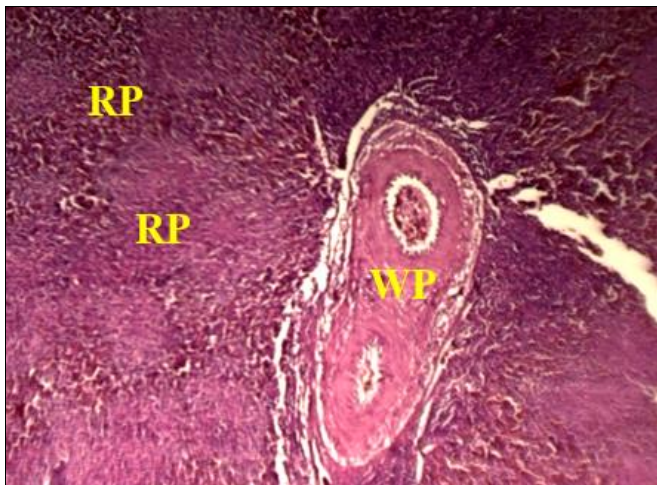
**Fig 1:** Average weight of spleen during post-hatching age

According to some authors, a quick growth of spleen weight in the first weeks of age may be due to the histological maturation phenomena in the splenic parenchyma [5]. It has been found in chickens, that the spleen reaches its maximum size in the first 6 weeks of postnatal age [6].

[7, 8] report a similar evolution characterized by a progressive development of spleen weight during the first week of postnatal life, followed by stable phase. This is due to the increase in the number of germinal centers during the first weeks (4th and 7th week) and the no antigenic stimulation during the last weeks.

### Histological Study of the Spleen

Fig. 2 shows the normal histological aspect of spleen. We note that the white pulp (BP) consists of lymphoid aggregates and the red pulp (RP), which represents the bulk of the body, has a richly vascularized network. The spleen is covered with a thin outer capsule fibro-elastic from which connective short trabeculae extend into the parenchyma in all mammals but not in birds. Our results showed that the weight pulp and red pulp are intermingled and there is no limit between two pulp.



**Fig 2:** Histological aspect of spleen in 8<sup>th</sup> week of age WP: Weight pulp, RP: red pulp

### Conclusion

The morphometric and histological evolution of the spleen during post-hatching age showed that spleen average weight peaked development at 6<sup>th</sup> week of age and remains in a relative stability until 8<sup>th</sup> weeks of post-hatching age. The weight pulp and red pulp are intermingled and there is no limit between two pulp.

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