

<b>1. Introduction</b>	<b>Page 13</b>
<b>2. Literature review</b>	<b>15</b>
<b>2.1. Importance of neonatal respiratory disease</b>	<b>15</b>
<b>2.2. Conditions associated with respiratory disease or distress in the foal</b>	<b>16</b>
<b>2.2.1. Equine neonatal pneumonia</b>	<b>16</b>
<b>2.2.2. Prematurity and respiratory distress syndrome (RDS)</b>	<b>18</b>
<b>2.2.3. Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS)</b>	<b>20</b>
<b>2.2.4. Perinatal asphyxia syndrome (PAS)</b>	<b>21</b>
<b>2.2.5. Systemic inflammatory response syndrome (SIRS)</b>	<b>23</b>
<b>2.3. Clinical manifestation of respiratory disease in neonatal foals</b>	<b>25</b>
<b>2.3.1. Historical findings</b>	<b>25</b>
<b>2.3.2. Physical examination findings</b>	<b>25</b>
<b>2.4. Diagnostic evaluation of neonatal respiratory disease</b>	<b>26</b>
<b>2.4.1. Alterations in the complete blood count (CBC)</b>	<b>26</b>
<b>2.4.2. Alterations in the serum biochemistry analysis</b>	<b>26</b>
<b>2.4.3. Serum anion gap (AG)</b>	<b>27</b>
<b>2.4.4. Arterial blood gas analysis</b>	<b>28</b>
<b>2.4.5. Other laboratory data</b>	<b>33</b>
<b>2.4.6. Clinical pulmonary function testing in neonatal foals</b>	<b>33</b>
<b>2.4.7. Upper airway endoscopy</b>	<b>35</b>
<b>2.4.8. Thoracic ultrasound examination</b>	<b>35</b>
<b>2.5. Thoracic radiography</b>	<b>36</b>
<b>2.5.1. Radiographic pattern recognition</b>	<b>37</b>
<b>2.5.1.1. Interstitial lung pattern</b>	<b>37</b>

2.5.1.2. Bronchial lung pattern	38
2.5.1.3. Alveolar lung pattern	38
2.5.2. Radiographic scoring systems	38
2.6. Risk factors and prognostic variables of equine neonatal disease	40
3. Study design	41
3.1. Objectives	41
3.1.1. Section one	41
3.1.2. Section two	41
3.2. Material and methods	42
3.2.1. Section one: The clinical and prognostic significance of radiographic pattern, distribution and severity of thoracic radiographic changes	42
3.2.1.1. Image quality criteria	44
3.2.1.2. Scoring system for equine neonatal thoracic radiographs	45
3.2.1.3. Part one: The association between selected clinical parameters and the type of pulmonary radiographic disease manifestation	51
3.2.1.4. Part two: The impact of pattern recognition, distribution, and severity of pulmonary changes on short-term survival	53
3.2.2. Section two: Risk factors and prognostic variables for survival of foals with radiographic evidence of pulmonary disease	53
3.3. Statistical analysis	58
3.3.1. Section one	58
3.3.2. Section two	60

<b>4. Results</b>	<b>61</b>
<b>4.1. Results of section one: The clinical and prognostic significance of radiographic pattern, distribution and severity of thoracic radiographic changes in neonatal foals</b>	<b>61</b>
<b>4.1.1. Reproducibility of the equine neonatal radiographic scoring system</b>	<b>61</b>
<b>4.1.2. Radiographic pattern distribution</b>	<b>63</b>
<b>4.1.3. Results of part one: The association between selected clinical parameters and the type of pulmonary radiographic disease manifestation</b>	<b>67</b>
<b>4.1.3.1. Arterial blood gas parameters</b>	<b>69</b>
<b>4.1.4. Results of part two: The impact of pattern recognition, distribution, and severity of pulmonary changes on short-term survival</b>	<b>70</b>
<b>4.1.4.1. Radiographic changes over time</b>	<b>72</b>
<b>4.2. Results of section two: Risk factors and prognostic variables for survival of foals with radiographic evidence of pulmonary disease</b>	<b>74</b>
<b>4.2.1. Results of part one: Clinical variables, which may predispose neonates or indicate respiratory disease</b>	<b>74</b>
<b>4.2.1.1. Arterial blood gas analysis</b>	<b>75</b>
<b>4.2.1.2. Systemic inflammatory response syndrome (SIRS)</b>	<b>76</b>
<b>4.2.2. Results of part two: Clinical variables, which may predict survival of foals with radiographic evidence of pulmonary infiltrates</b>	<b>76</b>
<b>4.2.2.1. Multivariate outcome analysis</b>	<b>79</b>

4.2.2.2. The impact of arterial blood results and anion gap on survival	79
5. Discussion	81
5.1. Discussion of section one: The clinical and prognostic significance of radiographic pattern, distribution and severity of thoracic radiographic changes in neonatal foals	81
5.1.1. The equine neonatal radiographic scoring system	81
5.1.1.1. Reproducibility of the equine neonatal radiographic scoring system	82
5.1.1.2. Radiographic pattern and distribution	83
5.1.2. Discussion of part one: The association between selected clinical parameters and the type of pulmonary radiographic disease manifestation in neonatal foals	84
5.1.2.1. The systemic inflammatory response syndrome (SIRS)	84
5.1.2.2. The impact of selected clinical parameters on pulmonary pattern	85
5.1.2.3. Conclusion	87
5.1.3. Discussion of part two: The impact of pattern recognition, distribution, and severity of pulmonary changes on short-term survival	87
5.1.3.1. Radiographic changes over time	88
5.1.3.2. Conclusion	88
5.2. Discussion of section two: Risk factors and prognostic variables for survival of foals with radiographic evidence of pulmonary disease	90

<b>5.2.1. Discussion of part one: Clinical variables, which may predispose neonates or indicate respiratory disease</b>	<b>90</b>
<b>5.2.2. Discussion of part two: Clinical variables, which may predict survival of foals with radiographic evidence of pulmonary infiltrates</b>	<b>91</b>
<b>5.2.2.1. Dystocia and perinatal asphyxia syndrome (PAS)</b>	<b>92</b>
<b>5.2.2.2. Impact of creatinine on neonatal survival</b>	<b>92</b>
<b>5.2.2.3. Other clinical and laboratory data</b>	<b>93</b>
<b>5.2.2.4. Arterial blood gas analysis</b>	<b>94</b>
<b>5.2.2.5. The effect of anion gap (AG) on survival of neonatal foals with radiographic respiratory disease</b>	<b>94</b>
<b>5.2.2.6. Conclusion</b>	<b>97</b>
<b>5.3. Study limitations</b>	<b>97</b>
<b>5.4. Clinical significance</b>	<b>98</b>
<b>6. Summary</b>	<b>99</b>
<b>7. Literature references</b>	<b>103</b>