ADAPTATION ABILITY OF NATURAL IMMUNE SYSTEM IN CINTA SENESE SWINE AND COMMERCIAL HYBRID BREEDING PIGS TO OUTDOOR FARMS
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INTRODUCTION
Evaluation of welfare in breeding animals is one of the main topics of both the European and national legislation. Whenever a stress status becomes chronic, all the non-adaptive immune system is involved, thus resulting in evident conditioned pathologies.

This innate part of the immune system is easily influenced from environmental stress. In this work we monitored in an intensive breeding herd on outdoor growing and finishing, and in an outdoor pig farm to evaluate whether and to what extent the breeding system may affect the non-adaptive immune system.

MATERIALS AND METHODS
The study was conducted on three different breeding herds: An outdoor Cinta Senese farm. The herd, located on an hill area, had a population of twenty productive sows. The sows were kept in separate indoor pens inside a hut with a large veranda. The piglets, weaned at nearly thirty five days of age, were moved to a separate one acre paddock.

Traditional indoor pig farm with 200 on production sows. Pregnant sows were reared in small group pens or in individual cages. The building was naturally ventilated without any heating system. The farrowing houses had traditional raising farrowing pens with steel slatted floor.

Traditional intensive indoor pig farm. The herd was composed of hybrid commercial sows, producing self replacement gilts. The farm was organized on a multi-sites basis (three sites production: breeding herd, nursery and fattening unit). The fattening unit had rooms dimensioned on the pig number receiving each week to adopt all in / all out policy, allowing washing and disinfection procedures. Each pen had complete slatted floor and internal temperature was properly maintained by a suitable heating system. A forced ventilation system was installed.

RESULTS AND DISCUSSION
Serological test results are summarized in table 1 Significant differences on serum bactericidal activity and total serum lysozyme values between classic indoor versus outdoor pig farm were recorded, while statistical differences between the two outdoor farms were not seen. The parameter values obtained differ mainly for serum bactericidal activity (> 40 %). This result could be due to a different environmental condition in the farms.

Non-specific immunity parameters comparison between the breeding herds monitored (mean ± SD).

<table>
<thead>
<tr>
<th></th>
<th>Reference values</th>
<th>Intensive traditional breeding</th>
<th>Commercial hybrid outdoor breeding</th>
<th>Cinta senese outdoor breeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum Lysozyme µg/ml.</td>
<td>&gt;1 -&lt;3</td>
<td>1.48 ± 0.1 A</td>
<td>2.82 ± 0.6 B</td>
<td>2.58 ± 0.2 B</td>
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<tr>
<td>Haemolytic Complement Activity CH50/150 µl</td>
<td>&gt;80</td>
<td>83.9 ± 1.83 A</td>
<td>90.7 ± 2.81 B</td>
<td>90.9 ± 2.19 B</td>
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<tr>
<td>Serum Bactericidal %</td>
<td>&gt;40</td>
<td>54.3 ± 2.1 A</td>
<td>31.2 ± 1.21 B</td>
<td>30.8 ± 2.17 B</td>
</tr>
</tbody>
</table>

A, B: P<0.05

MATERIALS AND METHODS
Sampling. A total of ninety blood samples, thirty for each breeding were collected.

Serum lysozyme, serum bactericidal activity, haemolytic complement activity were investigated. Lysozyme determination leads to monitor the functionality of the macrophages haematophage system and it is indicative of ongoing inflammation. Its concentration value was expressed in µg/ml.

Serum bactericidal activity is a major parameter for evaluating the activity of the non-specific immune system. The haemolytic complement assay provides indications on the defence mechanisms of the animal that contemplate activation of the complement system. Its concentration is expressed as CH50.