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 topic 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
(avgs ±SD)

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

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 bactericidial 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.

RESULTS AND DISCUSSION

Serum bactericidal activity values recorded in both outdoor farms are lower then traditional indoor farm (natural antibodies levels decreasing). At the same time total serum lysozyme levels are increased although still within the normal range. This fact could be due mainly to a granulocytic de-granulation rather then an increased activation of monocitary – macrophagic system.
The use of non-specific immune parameters could be useful to have information on the animal capacity to adapt to the living environment. This capacity could be influenced also by the genetic patrimony. Further investigation on the different environmental conditions might highlight which breeds are more suitable for the different breeding typologies.