e-Journal SANITA' PUBBLICA VETERINARIA SPVet.it
Pubblicato su: SPVet.it - ISSN 1592-1581 (http://spvet.it/; http://indice.spvet.it); Numero 68/2011, Speciale Poster

ISTITUTO ZOOPROFILATTICO SPERIMENTALE DELL'UMBRIA E DELLE MARCHE-PERUGIA
2011 Joint Annual Meeting
Italian Society for Immunology (SIICA) and German Society of Immunology (DGfI) Conference Center "Palericcione" Riccione - Italy September 28th October 1st
SIICA Società Italiana di Immunologia Clinica e Allergologia

INNATE IMMUNITY OF HEALTHY PIGS IN A MODERN PRODUCTION FARM: TWO SEASON IN COMPARISON

L. Moscati, M. Sensi, M. Pela, L. Battistacci, E. Scoccia and C. Maresca

Istituto Zooprofilattico Sperimentale Umbria e Marche, via G. Salvemini 1, Perugia, Italy

Introduction

Various environmental effects may adversely bear on welfare of farmed pigs under intensive farming conditions, which may cause chronic rather than acute stress as a long-term effect of modern husbandry techniques. These may in fact overtax the animals' coping ability and force them to long-lasting homeostatic control actions. In general, whenever animals are forced to severe, prolonged coping reactions with a considerable energy expense, welfare is poor and a serious depression of the immune system eventually turns out as one of the negative outcomes.

Materials and methods

In this work we studied the innate immune system modification in thirty swine of a "healthy" herd. It was classified as "healthy" because of the very low levels of environmental stressors evidenced in repeated inspections and the conclusion was confirmed by the main farm production figures at the beginning of the trial.Venous blood samples were collected monthly from April to July (15 animals) and from December to March (15 animals) in vacuum tubes without anti-coagulant. Serum lysozyme was measured by the lyso-plate assay. Serum Bactericidal Activity was performed according to a previous method validated for cattle (Amadori, 1997). The haemolytic complement assay was carried out in microtitre plates. Iron and zinc were assessed by a Konelab 200 biochemical analyzer using specific kits (Sentinel Diagnostics, Italy). The one sided Mann- Whitney test was used to compare data in two different swine groups tested in two seasons (Summer and Winter); the one-sided p-value was calculated and statistical significance was considered at $p \leq 0.05$. Statistical analysis was performed with Stata11.1 (StataCorp LP StataCorp).

Tab 1 February blood sampling

T2	ESTATE	INVERNO	P
Battericidia %	38.59 ± 19.78	25.20 ± 10.85	P<0.05
Complemento CH50	93.42 ± 13.96	99.80 ± 0.41	N.S.
Lisozima µg/ml	3.57 ± 0.78	6.15 ± 1.43	P<0.001
ROM's mmol H2O2	26.33 ± 3.68	45.93 ± 9.46	P<0.001
PAO µmol HCLO neutralizzate	384.55 ± 41.07	219.45 ± 29.68	P<0.001
Aptoglobina mg/ml	0.81 ± 0.36	1.32 ± 0.75	N.S.
Zn µg/dl	354.72 ± 259.12	80.50 ± 13.50	P<0.001
Fe µmol/l	44.47 ± 13.08	25.19 ± 5.15	P<0.001
PT g/l	81.13 ± 6.71	79.57 ± 3.44	N.S.
Albumina g/l	32.61 ± 4.62	33.88 ± 1.61	N.S.
α globuline g/l	10.35 ± 3.43	13.01 ± 2.47	P<0.05
β globuline g/l	24.49 ± 7.24	15.38 ± 2.64	P<0.001
γ globuline g/l	14.56 ± 2.63	17.30 ± 2.03	P<0.05

Tab 2 March blood sampling

T3	ESTATE	INVERNO	P
Battericidia %	39.25 ± 25.87	26.54 ± 11.86	P<0.05
Complemento CH50	93.82 ± 10.75	75.38 ± 17.95	P<0.001
Lisozima µg/ml	3.80 ± 0.74	2.01 ± 0.45	P<0.001
ROM's mmol H2O2	29.36 ± 5.57	34.32 ± 5.85	P<0.05
PAO µmol HCLO neutralizzate	308.08 ± 72.10	213.99 ± 18.24	P<0.001
Aptoglobina mg/ml	0.65 ± 0.45	1.93 ± 2.04	P<0.05
Zn µg/dl	224.18 ± 116.56	121.47 ± 22.17	P<0.001
Fe µmol/l	29.49 ± 5.42	32.58 ± 6.87	N.S.
PT g/l	70.37 ± 4.10	83.17 ± 6.94	P<0.001
Albumina g/l	29.19 ± 2.75	35.25 ± 2.96	P<0.001
α globuline g/l	12.57 ± 1.56	13.67 ± 2.94	N.S.
β globuline g/l	15.21 ± 2.48	19.02 ± 5.21	N.S.
γ globuline g/l	12.73 ± 2.38	15.18 ± 3.70	P<0.05

Results and Discussion

In the summer season all groups investigated showed bactericidal activity and free complement values higher than in winter season (P<0.05). Lysozyme activity resulted significantly higher (P<0.05) then normal in winter season. Significantly reduction (P<0.05) of iron and zinc were evidenced in winter season (Tab. 1 Tab. 2).

The investigations results provide indications that natural immune system varies according to the winter or summer season even if swine are recovered. Probably the changes recorded may be attributable to the environmental stress induced into the animals by lower winter temperature.

Thermal discomfort forces the natural immune system to cope with sub-optimal environmental conditions. An exposure to cold environment temperature compromises their innate immunity status, making them much more susceptible to other stressors or specific diseases.

Research supported by the grant RF 2006 from the Italian Ministry of Healt