HAEMATOLOGICAL RESEARCH ON PIGS AFTER USING SOME NONSPECIFIC IMMUNOMODULATORS

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Abstract

Batches of piglets reared in intensive system were nonspecific immunomodulated During the experiment, three blood samples, necessary for haematological determinations,have been performed.
In group A, it was administrated a bacterial suspension (Corynebacterium parvum). Group B received Levamisol product (for veterinary use) and group C received vitamin E and Selenium, using Romselevit. Group D was used as a witness group, being submissed to vaccination only. Hemoglobin concentration in group A (modulated with Corynebacterium parvum), significantly increased after the second harvest compared to harvest I. The final collection showed a significant decrease in these concentrations, all distinctly significant compared to harvest II. In groups B, C, and D, hemoglobin concentrations showed an increase in statistical terms ,only at an intermediate collection (highly significant), then remained constant.In group A, modulated with Corynebacterium parvum, hematocrit increased significantly distinct from harvest I. The final collection showed a decrease in these levels, manifested statistically significant from the second harvest.In groups B and D, hematocrit increased statistically at the intermediate harvest (significant) The final harvest was similar to the intermediate concentrations. In group C there were changes in the sense that after a distinctly significant increase in hematocrit values ,it decreased at the intermediate harvest without any interest in statistical terms. The number of red blood cells showed a distinctly significant increase in group A,at the second collection compared to the first one ,the final harvest decrease being statistically significant.

Key words: *hemoglobin, immunomodulation, piglets.*

INTRODUCTION

The resistance capacity of the animal body can be increased through the use of imunomodulators (Lee, et al, 2000; Xie and Song, 2000), some of which can act specifically inducing different effects (destruction of pathogen germs or the blocking of their activity), in this category falling the vaccines, immune sera, and even antibiotics (Mikulska-Skupien et al. 2004).

The intensity of the immune response can be increase also nonspecifically (Beuth et al. 2002; Kim and Hyun, 2000) for a certain type of agressor, by the use of a various range of cellular structures, organic or anorganic substances.
The hematomogical reaction of the body after the potentiation with nonspecific substances was observed, over the immune response induced by the the classical swine fever and swine erysipelas vaccination (specific immunomodulation), in piglets reared in intensive system.

MATERIALS AND METHODS

32 piglets were submitted to testing, in 4 groups (A,B,C,D), starting with age of 52 days old, testing being conducted in an intensive piggery.
In group A was administered a bacterial suspension (Corynebacterium parvum) in saline solution (2 mg bacterial body dry residue/ml) through the use of Imunostimulent S.R.E. Corynebacterium parvum, subcutaneous administration.
Group B received Levamisol (for veterinary use), administered subcutaneous, and lot C received vitamin E and selenium, using the product Romselevit, also administered subcutaneous.
Group D was used as a witness group, being submitted only to vaccination.
The vaccination against Classical Swine Fever and Swine Erysipelas was accomplished with a suspension of attenuated Classical Swine Fever virus with the minimal titre of 1000 DICF 50/ml and culture of Erysipelothrix rhusiopathiae (VR_2 strain) with minimal germ concentration of $5x10^7$ UFC/ml, at 60 and 120 days old.
The animals had normal feeding and microclimate the entire experiment.
The experiment was conducted on a period of 85 days, during which there were three blood sampling.

Quantified parameters
- hemoglobinemia;
- hematocrit
- red blood cell count (absolute values)

The hematological determinations were conducted through the electronical method with a Coulter-Counter CBC-5 analyzer.

RESULTS AND DISCUSSION

The Hemoglobin concentration (table 1, graphic 1) in group A (modulated by *Corynebacterium parvum*), increased significantly distinct ($p<0,01$) in the second blood sampling (13,14±1,89 g /dl), opposite to the first blood sampling (10,61±0,81 g/dl), and in the final blood draw decreasing significantly distinct ($p< 0,01$), from 13,14±1,89 g /dl (2^{nd} sampling) to 10,27±2,26 g /dl at 3^{rd} sampling.

In groups B, C and D, Hemoglobin concentrations were increased with statisctical importance only in the 2nd sampling (significant high p<0,001) and after that maintained constant.

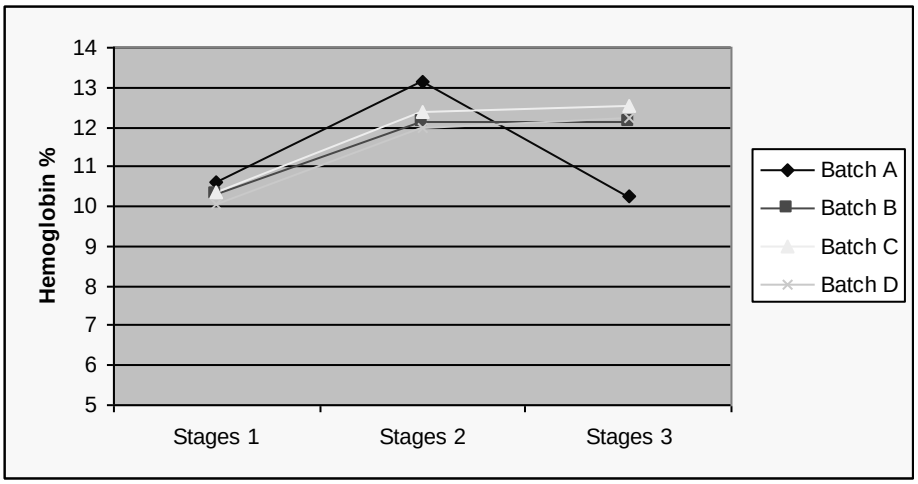
Table 1 - Hemoglobinemia (g /dl)*

Group	Stages		
	I	II	III
A	10,61±0,81	13,14±1,89**	10,27±2,26**
B	10,33±0,7	12,11±0,81***	12,13±1,14
C	10,37±1,06	12,4±0,81***	12,54±0,32
D	10,04±1,11	12,0±0,87***	12,24±1,23

** = significantly distinct difference;
*** = significantly high difference.

Regarding the hematocrit, the statistic result were :
-in group A, modulated by *Corynebacterium parvum*, the increase was significantly distinct (p<0,01) at the second sampling (39,07±5,74%), compared to the first sampling (32,83±2,28%). At the final draw, there was a statistically significant decrease (p< 0,05), from 39,07±5,74 % at the second blood draw to 31,05±6,58 % at the 3rd blood sampling.

Graphic 1 – Representation of the hemoglobin concentration



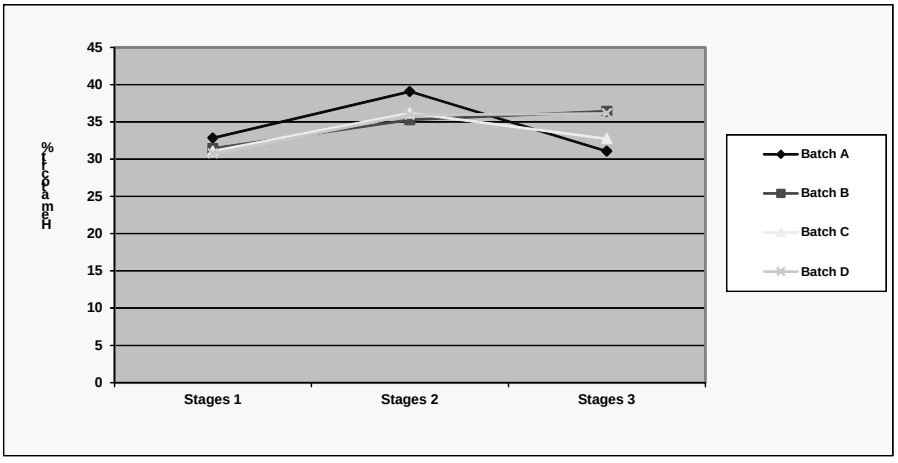
- in groups B and D, the hematocrit increased statistically in the intermediate blood draw (*significantly*–p<0,01), at the final sampling the concentrations were similar to thoseintermediate (table 2, graphic 2);
- in group C, after a significantly distinct increase (P<0,01) in the 2nd sampling (36,17±2,46%), the values dropped without interest from a statistical viewpoint (32,73±12,09 %).

Table 2 - Hematocrit (%)

Group	Stages		
	I	II	III
A	32,83±2,28	39,07±5,74**	31,05±6,58*
B	31,43±2,04	35,27±2,69*	36,43±3,26
C	31,07±2,83	36,17±2,46**	32,73±12,09
D	30,74±3,16	35,93±2,71*	36,13±3,59

* = significant difference;
** = significantly distinct difference.

Graphic 2 – Representation of the hematocrit



The red blood cells count had the following changes :
- in group A there was a significantly distinct increase (p< 0,01), at the second sampling (7,47±1,04%), opposite to the first sampling (36,23±0,4%), and in the final one, the increase was statistically significant (p< 0,05), (table 3, graphic 3);

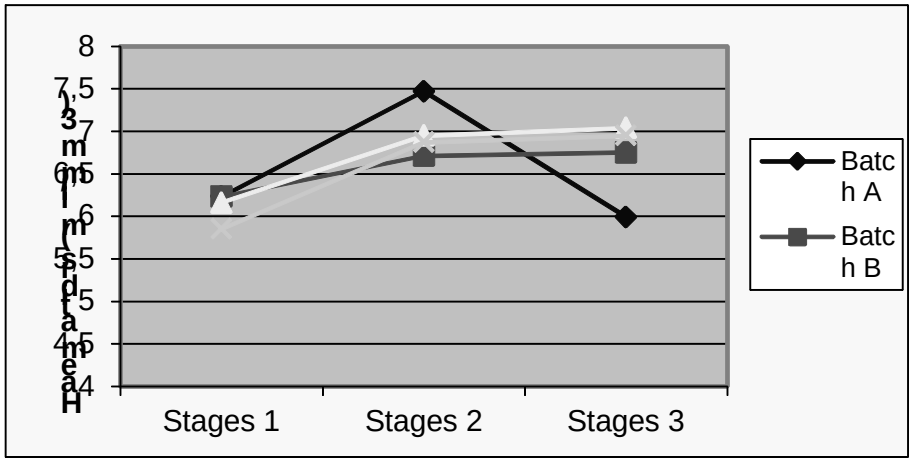
Table 3 - Haematids count in absolute values (mil/mm^3)

Group	Stages		
	I	II	III
A	6,23±0,4	7,47±1,04**	5,99±1,47**
B	6,23±0,41	6,71±0,52	6,75±0,52
C	6,16±0,22	6,95±0,44***	7,04±0,33***
D	5,85±0,73	6,87±0,52	6,95±0,71

** = significantly distinct difference;
*** = significantly high difference.

- in group C, the red blood cells count increased significantly high ($p< 0,001$), in the 2nd (6,95±0,44), and in the 3rd blood sampling also(7,04±0,33), compared to the initial one (6,16±0,22);
- in group B the increase was insignificant.

Graphic 3 – Representation of the Haematids count in absolute values (mil/mm^3)



CONCLUSIONS

Testing was conducted in an intensive system piggery, the animals beeing subjected to normal feeding and microclimate conditions during the experiment.
In group modulated by *Corynebacterium parvum*, the increase was significantly distinct at the second sampling, compared to the first sampling. At the final sampling, there was a statistically significant decrease.
In the *Corynebacterium parvum* modulated group the hemoglobin

concentration, the hematocrit and the red blood cell count had a similar evolution during the experiment, increasing (with statistical value) to the upper physiological limit in the second sampling compared to the first one. In the final sampling , the values decreased to the inferior limit.
In the remaining groups, all the tested hematological parameters presented simmilar manifestations during the experiment, beiing observed a statistically important increase only in the intermediate blood sampling, after which they maintained constant.

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