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EXPERIMENTAL MODEL TO BETTER KNOW THE SENSIBILITY TO STA-PHYLOCOCCUS AUREUS IN DIFFERENT COMMERCIAL RABBITS BREEDS

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Summary

The Staphylococcus aureus (S.a.) infections in commercial rabbits are well know (Renault and col. 1983). The lesions produced for this disease can be summarised in subcutaneous purulent abscesses, mastitis, metritis, pododermatitis, etc.

During the production period in several rabbitries we have observed different sensibilities to S.a. infections meaning that genetic resistance could be an important factor to be in account.

In this study we carry out an experimental model based on a challenge using a pathogenic rabbit S.a. strain. We challenged 144 rabbits coming from 12 different breedings (NZ x CLF) with 10 exp 8 c.f.u. /rabbit, by subcutaneous route, and we observed them until 15 days post-inoculation.

We scored meanly the mortality, morbidity, decrease and increase weight rates, diffusion of the initial abscess to other body areas or viscera.

The results we obtained, have a high significance and also a high statistical correspondence ($p < 0.05$) when they are compared with the economic performances of the rabbitries facing this disease.

Introduction

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Material and methods

Rabbits

For this study, 144 rabbits coming from 12 industrial rabbitries of 300 - 400, (NZ x CLF) does each, were used.

Twelve rabbits divided in two flocks of 6 rabbits each (flock A and flock B), were used in each rabbitrie, in order to manage the data in two replications.

The rabbits were housed in flat-desk cages, in controled air and negative pressure departments.

Weaned rabbits, not older than 40 days and weighing between 700 and 1400 g were used.

Before starting the trial, all the animals were examined and no staphylococcal lesions were observed in any rabbit.

Staphylococcus aureus strain

For the infection, the strain (H.606) has been used, which was isolated from a clinical staphilococcal process causing purulent subcutaneous abscesses and mastitis. This strain, during her first passage, was kept in our laboratory.

For the infection 10 exp. 8 c.f.u./rabbit were inoculated by subcutaneous route in the shoulder.

Departments

Controlled air and negative pressure departments are used; and the air is filtrated by means of an absolute filter (HEPA).

Method

At the rabbit's arrival they were individually checked and housed in their cages. Two days later they were individually weighed and the S. a. strain was inoculated by subcutaneous route. Commercial feed and water were administered "ad libitum".

The rabbits were observed daily for 15 days, and any abnormality or dead animal was recorded. Dead animals were necropsied in order to chek the produced lesions.

At the 15th day all the surviving animals (see table I) were humanitary sacrified to observe internal lesions and Staphylococcus diffusion.

Table 1 Rabbit's weight average at days 0 and 15, and weight increase mean during the 15 days

Ref.	Flock	Weight day 0	Weight day 15	Inc.weight (grams)	Mean A and B
1	A	700	850	150	155
	B	720	880	160	
2	A	1.010	1.525	515	482
	B	1.080	1.530	450	
3	A	1.300	1.650	350	355
	B	1.310	1.670	360	
4	A	1.200	1.280	80	75
	B	1.230	1.300	70	
5	A	1.400	1.350	- 50	40
	B	1.380	1.350	- 30	
6	A	950	1.100	150	140
	B	940	1.070	130	
7	A	1.260	1.650	390	400
	B	1.250	1.660	410	
8	A	1.160	1.450	290	295
	B	1.140	1.440	300	
9	A	1.230	1.320	90	95
	B	1.250	1.350	100	
10	A	1.150	1.270	120	120
	B	1.170	1.290	120	
11	A	1.280	1.400	120	110
	B	1.300	1.400	100	
12	A	1.050	1.320	270	260
	B	1.080	1.330	250	

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Table 2 Rabbit's mortality until the 15th day post infection

Ref	Flock	Losses/Inoc	% Mort.	% Mortality mean
1	A	5/6	83.3	66.6
	B	3/6	50	
2	A	1/6	16.6	16.6
	B	1/6	16.6	
3	A	2/6	33.3	33.3
	B	2/6	33.3	
4	A	6/6	100	83.3
	B	4/6	66.6	
5	A	4/6	66.6	75
	B	5/6	83.3	
6	A	2/6	33.3	33.3
	B	2/6	33.3	
7	A	2/6	33.3	16.6
	B	0/6	0	
8	A	1/6	16.6	33.3
	B	3/6	50	
9	A	3/6	50	75
	B	6/6	100	
10	A	2/6	33.3	25
	B	1/6	16.6	
11	A	3/6	50	41.6
	B	2/6	33.3	
12	A	1/6	16.6	16.6
	B	1/6	16.6	

Table 3 Rabbit's morbidity until the 15th day post-infecction

Ref	Flock	Afect /Inoc	% Morb.	Morb. mean %
1	A	6/6	100	100
	B	6/6	100	
2	A	4/6	66.6	58.3
	B	3/6	50	
3	A	4/6	66.6	66.6
	B	4/6	66.6	
4	A	6/6	100	100
	B	6/6	100	
5	A	6/6	100	100
	B	6/6	100	
6	A	6/6	100	83.3
	B	4/6	66.6	
7	A	4/6	66.6	41.6
	B	1/6	16.6	
8	A	4/6	66.6	83.3
	B	6/6	100	
9	A	4/6	66.6	83.3
	B	6/6	100	
10	A	6/6	100	75
	B	3/6	50	
11	A	5/6	83.3	75
	B	4/6	66.6	
12	A	2/6	33.3	50
	B	4/6	66.6	

Table 4 Mortality, morbidity, weight increase and initial node diffusion valuation (calculing the A and B flock's mean)

Ref	Mortality	Morbility	Weight mean(gr)	Node diffus.
1	67 %	100 %	155	DIFFUSION
2	17 %	58 %	482	CAPSULATION
3	33 %	67 %	355	CAPSULATION
4	83 %	100 %	75	DIFFUSION.
5	75 %	100 %	- 40	DIFFUSION.
6	33 %	83 %	140	DIFFUSION
7	17 %	42 %	400	CAPSULATION
8	33 %	83 %	295	DIFFUSION
9	75 %	83 %	95	DIFFUSION
10	25 %	75 %	120	CAPSULATION
11	42 %	75 %	110	DIFFUSION
12	17 %	50 %	260	CAPSULATION

Table 5 Clinical history of the farms

Ref	Mastitis	Metritis	Hygiene
1	+	+	Bad
2	-	n.t.	Good
3	-	-	Normal
4	+	+	Normal
5	+	+	Bad
6	+	n.t.	Normal
7	-	-	Normal
8	+	-	Normal
9	+	+	Bad
10	-	-	Good
11	+	+	Normal
12	-	-	Good

Discussion

As we can observe in Table 1, the best weight increase is obtained in the references 2, 3, 7, 8 and 12. In the other references the increase is less, being even negative in the number 5.

In Table 2, we observe that the mortality in the references 2, 7, 10 and 12 is lesser than in the other references, being specially high in the references 1, 4, 5 and 9.

The biggest morbidity, that is to say anorexia, depression and no feed consumption, is obvious in the references 1, 4, 5, 6, 8, 9, 10 and 11, being the least in the references 2, 3, 7, and 12.

The primary node diffusion is reflected in Table 4 where we can see that the references 2, 3, 7, 10 and 12 capsulate the node whereas the other references diffuse it.

Comparing this results with the anamnestic information of this farm it is clear that the references 2, 7, 10 and 12 are the best. The reference number 7 corresponds to a farm with normal sanitary measures, therefore we should have in account the importance of the sanitary measures to avoid S.a. infection, so that a more sensible rabbit in a cleaner environment would be less susceptible to be infected.

We think that this simple method could be used for knowing the new hybrid's susceptibility to S.a. in industrial farms.

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