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APPLICATION OF "STREPTOCOCCUS FAECIUM M-74" IN FATTENING OF RABBIT

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Introduction

In the digestive tract of rabbits the concomitant flora is formed by Enterococcus and E.coli. The Clostridia, Staphylococci, proliferating fungi, Pseudomonas sp. and the Proteus sp. belong to the residium flora. Any kind of displacement of these rates for the good of the residuum-accompanying flora at the agricultural farm animals in consequence of the increase of burden brings about the decrease of performance and in case of the dominancy of facultative pathogenic germs the embriosis changes over into disbiosis. This causes intestinal infection consequent upon death /GEDECK 1986/.

The enteritic deaths of not parasitic origin can be moderated by registration of lactobacillus into the ration. The Streptococcus faecium culture in appropriate dose can be suitable also for rabbits - particularly after separation until intestinal flora is not formal - for the prevention of intestinal infections, it can promote the better digestibility of nutritive matters.

Methods and materials

The investigations were carried out in two steps on the rabbit farm of our institute. On the first occasion 42.5 weeks old New Zealand White rabbit was set in examination. The feeding test was supplemented also with metabolic examination by four animals per group. The animals consumed a rabbit feed of identical combination and nutritive matter content, deviation originated only from the ration of the bacterium culture.

1. treatment without supplementation
2. treatment o.4 g supplementation/animal/2 days
3. treatment 1.6 g supplementation/animal/2 days

/1 g supplementation contained 12o million S.f.M-74/

The preparation was distributed into the feed mixed pasty with water.

In the second experiment we devided litters of 2 weeks old into 3 parts with marking. For two-third of the rabbits we sprayed watery Streptococcus faecium paste into their mouths in increasing dose until separation on every other days. Their one-third /the subsequent control/ for the sake of the equivalent stress load, received corn-flake paste with identical method and quantity. At separation /5 weeks of age/ 3 groups were formed distributed the litter mates uniformly 3o animals per groups.

	Before and separation	after
1.group:	for lo days o.5 g for lo days 1.o g S.f./ animal/2 days	2.o g S.f./animal/2 days
2.group:	for lo days o.5 g for lo days 1.o g S.f./ animal/2 days	untreated
3.group:	corn flake	untreated control

/1 g supplementation contained loo million living germs/

Results

The numerical results of the feeding examination are given in the 1-2.tables.
In the first experiment slightly improved the mass gain /3-5 %/ and the feed utilization /2-3 %/ of the fattening rabbits on the influence of the bacterial preparation. It moderated in turn. statistically guaranteed the deaths originated from digestive organ illnesses.
From the control group 26 %, from the 2.resp.3.treatment 12 % resp. 7 % dropped out.

groups	1.	2.	3.
died in digestive organ syndrome	6	2	-
in respiratory organ syndrome	5	3	3
altogether	11	5	3

In the course of the analysis of Chi^2 values we found $P < 0,05$ significant difference between the deaths of the 1. and the 3. group.
A similar tendency came across also in the second experiment, but we did not receive significant differences there. In the group /1./ treated for a long time the death was by 5o % lower than in the control group /3./.

Utilization experiment

From the received data it can be seen, that the utilization coefficient of the crude fibre improved on the influence of the Streptococcus faecium. With respect to the other parameters we did not find any difference between the indexes /3.table/.

Discussion

The performace of the animals is closely connected with their state of health. The beneficial bioregulating result of lactobacilli affected on digestive organs appears mostly in reduction of death /Gedeck,1986./. The most critical period of the life of rabbits is the several weeks after separation. More than half of the whole deaths falls on this period. A 26-27 % death of our control groups can be said customary. The digestive organ illnesses are frequent the curve of daily increase shows decline. The separation, the carriage, the new place and the change-over on compact feed exclusively means large load for the animal. In this critical period of life probiotic supports to prevent the mentioned stress situations effectively in the organizm of the animal. The intestinal flora of little rabbits at weaning is still unformed. The lactic acid production of the Streptococci decreases the pH-value in the digestive tract preventing by this the large scale multiplication of the noxious bacteria - among others the E.coli appreciating a more alkaline medium and through the phenomenon of microbe concurrency the loosening of desired balance of the intestinal flora /Fuller,1977/. The normal intestine flora is constituted by facultative resp. strict anaerob, homo-resp. heterofermentative bacteria in 9o %, such as e.g. Lactobacilli, Bacteroides etc. Streptococcus faecium also ranks among these. The accompanying flora of some lo % is formed by E.coli and Enterococci and not more than o,ol % of the intestinal flora is constituted by Clostridia, Staphylococci etc. If the rate of species constituting the accompanying flora increases at the expense of the normal flora, then the animal falls ill /Savage,1981/.

There are three conditions for this to come about: the penetration, the sticking and the multiplication. The relatively large /12o million per g/ of Streptococcus faecium ingested with the feed proportionately decreases the mass of the penetrating accompanying bacteria. Their presence means constant slight

stimulus for the intestinal mucous membrane and stimulates by this for the production of a protective slime cover. It takes part to some extent in the constitution of the protective membrane preventing the sticking of species constituting the accompanying flora. Againts these it displays continuous antagogistic effect with the aid of the produced volatile fatty acids and nutritive matter withdrawal /Miles, Araja,Harms,1981/. The great difference we experienced at the deaths of the control and treated groups can be explained by all these supposed joint effects.

By the early /from 2 weeks of age/ feeding of lactobacillus we searched for an optimal point of time we can intervene in the formation of the favourable intestinal flora with the greatest effect. It is extraordinarily difficult to ingest medicament into the organizm of the little rabbits consuming only breast milk, it can be said it is probable only under experimental conditions.

Because of this, though the results are encouraging, it is worth to intervene only when the little ones change over to solid feed. Even then only if can be solved the mixing of the preparation into the feed without damage.

On the basis of the data of the utilization experiment by the distribution of Streptococcus faecium in increasing dose the digestibility of the crude fibre improved. It is presumable, that this is due to the positive effect the preparation displayed on the function of the cellulotic bacteria.

Summing up we can say, that the favourable effect of the Streptococcus faecium is presumably due to that it prevents the harmful bacteria to penetrate, to stick and to multiply in the intestinal flora. It decreases the pH value in the digestive tract hindering with this primarily the multiplication of the E.coli, It promotes the multiplication of the cellulitic bacteria what contributed to the better digestibility of the crude fibre. The precondition of the practical use of the product is that it can be mixed into the rabbit feed without damage.

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1.table

Streptococcus faecium M-74

Result of the 1. experiment

		1. control	II. experimental	III. groups
o-2 weeks				
Starting stock		42	42	42
Daily mass gain	$\bar{x}$ g	27,2 ± 7,1	29,3 ± 4,6	27,6 ± 4,67
Feed consumption	$\bar{x}$ g	85,5 ± 11,6	9o,9 ± 8,5	89,8 ± 1o,2
Feed utilization	$\bar{x}$	3,24± o,84	3,17± o,49	3,3o± o,39
Death	pcs.	1	2	-
2-5 weeks				
Daily mass gain	$\bar{x}$ g	33,5 ± 5,4	33,7 ± 5,3	35,9 ± 4,61
Feed consumption	$\bar{x}$ g	118,1 ± 14,4	113,2 ± 14,3	118,5 ± 13,7
Feed utilization		3,56± o,49	3,36± o,59	3,3o± o,57
Death	pcs	1o	3	3
o-5 weeks				
Daily mass gain	$\bar{x}$ g	3o,9 ± 6,3	31,9 ± 4,4	32,6 ± 4,63
Feed consumption	$\bar{x}$ g	1o4,9 ±12,2	1o4,3 ± 11,9	1o8,o ± 11,5
Feed utilization		3,38±o,61	3,27± o,51	3,34± o,42
Death	pcs.	11x	5	3x
Death	%	26	12	7

x P o,o5

2. table

Streptococcus faecium M-74

	I. experimental groups	II. experimental groups	III. control
o-2 weeks			
Starting stock pcs.	3o	3o	3o
Daily mass gain $\bar{x}$ g	22,4 ± 3,6	21,1 ± 5,2	24,3 ± 3,2
Daily feed consumption $\bar{x}$ g	59,6 ± 8,4	52,5 ± 6,6	59,7 ± 7,4
Feed utilization	2,7o ± o,49	2,49 ± o,51	2,47 ± o,36
Death pcs.	2	3	7
2-5 weeks			
Daily mass gain $\bar{x}$ g	3o,1 ± 5,7	3o,4 ± 5,2	28,2 ± 4,6
Daily feed consumption $\bar{x}$ g	87,5 ± 11,7	92,3 ± 11,9	9o,6 ± 8,9
Feed utilization	2,96 ± o,47	3,o8 ± o,42	3,27 ± o,48
Death pcs.	2	2	1
o-5 weeks			
Daily mass gain $\bar{x}$ g	27,o ± 3,7	26,7 ± 3,o	26,6 ± 3,o
Daily feed consumption $\bar{x}$ g	76,4 ± 8,o	76,5 ± 8,4	78,2 ± 7,4
Feed utilization	2,85 ± o,33	2,86 ± o,36	2,95 ± o,34
Death pcs.	4	5	8
Death %	13	17	27

3. table

Percentage of digestibility coefficients

Groups	Dry matter	Crude ash	Organic matter	Crude protein	Crude fibre	Crude fat	N.F.E.
I. $\bar{x}$	66,7o	52,15	67,79	64,89	24,46	83,37	78,16
$s^{\pm}$	o,85	2,81	o,75	1,o7	2,o2	o,74	1,o3
II. $\bar{x}$	67,76	51,58	68,14	65,o9	28,14	82,86	77,54
$s^{\pm}$	1,13	2,2o	1,17	1,42	2,33	1,o6	1,o8
III. $\bar{x}$	66,9o	52,32	67,97	64,28	32,83	83,o3	78,o1
$s^{\pm}$	o,95	1,84	o,87	1,17	2,3o	o,92	1,16

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APPLICATION OF "STREPTOCOCCUS FAECIUM M-74" IN THE FEEDING OF MEAT RABBIT

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The effect of "S.f.M-74" on rabbits was examined in a two-step study. In one the group was formed from 3x42, five week old New Zealand White rabbits. First treatment:without supplementation, second treatment: o.4 g "S.f.M-74" per animal per two days, third treatment : was given 1.6 g "S.f.M-74" per animal per two days supplementation /1 g supplementation contained 12o million living folic acid bacteria/. Its application slightly improved mass gain and feed utilization and significantly the death rate /P o,o5/. The digestibility of crude fibre also increased. The second study was devided into two sections:from 2 to 5 weeks of age the animals of the I. and II.group received identical treatment. 5-10 weeks of age the ration of the I.group was raised,in the II.the distribution of the preparation was stopped. The III. control group remained untreated from beginning to end. There was no significant difference between the results of the two experimental groups, as compared to the control death was significantly better.

DIE ANWENDUNG VON" STREPTOCOCCUS FAECIUM M-74" IN NAHRSTOFFÜTTERUNG VON MASTKANINCHEN

Der Effekt von "S.f.M-74 " auf Kaninchen wurde in zweistufigem Versuch untersucht. In einem der Versuche wurde eine Gruppe von der neuseeländische weißen Kaninchenrasse im Alter von 5 Wochen /3x42/ gebildet. Die Behandlung I.erfolgte ohne Zuschlagstoffe, die Behandlung II.mit "S.f.M-74 " von o,4 g /pro Tier pro 2 Tage/, die Behandlung III.auch mit "S.f. M-74" Zuschlagstoff von 1,6 g/pro Tier pro 2 Tage/. 1 g Zuschlagstoff enthielt 12o Million lebendige Milchsäurenbakterien. Ihre Anwendung machte den Massenzuwachs und die Futterverwertung weniger, den Abfall aber signifikant /P<o,o5/ besser. Auch die Verdaulichkeit der Rohfasern hat sich gewachsen.Der zweite Versuch hat sich auf 2 Perioden getelt: die Tiere der ersten und zweiten Gruppen bis zum Alter von 2-5 Wochen bekaerhöht bis in der Gruppe II. die Dosierung des Preparats abgeschaft wurde.Die Gruppe III. /kontrolle/ ist während der ganzen Periode unbehandelt geblieben. Es gab keinen signifikanten Unterschied zwischen den Ergebnissen von zwei Untersuchsgruppen, im Vergleich zur Kontrollgruppe war der Abfall signifikant niedriger.