

## EFFECT OF DIETARY SACCHARICTERPENIN TO RABBIT PRODUCTION PERFORMANCE

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### ABSTRACT

The present study was conducted to approach the possibility to substitute antibiotic with saccharicterpenin. In the study 36 growing California rabbits at similar age were divided into 3 groups. For group of the control olaquinox was applied and for group I and group II 200 ppm and 400 ppm saccharicterpenin were applied. The results of this 7-week experiment were the following: (1) The daily gain and feed conversion ratio for the group of control and group I and II were 23.9, 22.0, 24.5 g/d and 3.9, 4.1, 3.8 respectively. Compared with the group of control, daily gain of the group I decreased 7.9% ( $P < 0.05$ ) and the feed conversion ratio increased 5.1% ( $P < 0.05$ ). In the case of group II, the daily gain increased 2.5% ( $P < 0.05$ ) and conversion ratio decreased 2.6% ( $P < 0.05$ ). (2) In the group of control, group I and group II 5, 5 and 4 rabbits were infected with diarrhea and 1, 1 and 0 rabbits died. Although the number of observations is small, these results suggest that saccharicterpenin at level of 400 ppm could be used as an alternative to olaquinox.

**Key words:** saccharicterpenin; productive performance; growing rabbits.

### INTRODUCTION

Saccharicterpenol is a kind of natural active substance extracted from oil tea seed and rape seed cake. It is a mixture of sugar, triterpene saponin and organic acid with a color of yellow to brown, powder, tasted a little bite bitter and chill, stable effective component and no compatibility contraindication when applied in diet or with any medicine. It is reported that saccharicterpenol is effective to improve immunity of neurosecretion, to remove free radical and is anti-oxidation. Saccharicterpenol could be used to replace antibiotic substance in organic feed production. Up to now no literature about its

utilization in rabbit feed has been found and on this purpose present study was conducted.

## **MATERIALS AND METHODS**

### **Animals**

The experiment was carried out in the Experimental Rabbit Farm, the animal Husbandry and Veterinary Institute of Shanxi Academy of Agricultural Sciences. In the farm there are 10 half-open rabbit houses, 200 standard rabbit cages and 1 house for grower rabbits.

36 healthy weaning California rabbits at similar age were selected and divided into 3 groups. In each group 12 rabbits of half to half of the male and the female. These three groups are randomly designed as control, group I and group II. During the pre-experiment period of 7 days the same experimental diet was applied. At the end of pre-experiment period when the body weights of all groups showed no remarkable differences, the experiment started.

### **Diets**

For group I and II diet with sacchariterpenin at two different levels (200 and 400 ppm) was supplied and for the control group diet with olaquinox (LIANG QUANZHONG,1985) was used. The applied sacchariterpenin was prepared by the Bio-activity Center of Zhejiang University. The formula of the basic diet is the following: corn 27.3%, wheat bran 21.3%, bean cake 16.3%, millet grass 33.4%, CaHPO<sub>4</sub> 1.4%, salt 0.3% and some proper dosage of trace elements. Its nutrition values are the following: dry matter 86.75%, crude protein 16.20%, crude fiber 13.84%, crude fat 1.86%, crude ash 7.55%, Ca 0.81 and P 0.15%. The basic diet was pelletized. In addition, everyday 70 to 100gram chicory (*Cichorium intybus* L.) was fed to each rabbit.

### **Experimental procedure**

The experiment period lasted for 7 weeks from April 17<sup>th</sup>, 2002 to June 5<sup>th</sup>, 2002. The experimental rabbits were kept in cages and in each cage two rabbits were kept. Feeding and water was provided *ad libitum*. In the experiment items of initial/final weight, intake, body weight in every week for net intake, were measured and infection of diseases like diarrhea and mortality were recorded.

The results of present experiment were treated with SAS software.

## RESULTS

### Effect on growth rate

Table 1 shows that the daily gain for the group of control and for group I and group II were 23.9, 22.0 and 24.5g/d. The daily gain of group I was 7.9% ( $P>0.05$ ) lower and the daily gain for group II was 2.5% ( $P>0.05$ ) higher than that of the control. It means that an addition of 200 to 400ppm sacchariterpenin has got no remarkable effect to daily gain of the rabbit. In addition, the conversion ratio of group I was 5.1% higher and the ratio of group II is 2.6% lower than that of the control. It means that sacchariterpenin has no remarkable effect to feed conversion ratio.

**Table 1. Effects of dietary sacchariterpenin in the performance of growing rabbits**

Group	n	Initial weight (g)	Final weight (g)	Mean daily gain (g)	Feed conversion ratio
Control	11	826.6±106.2	1996±180	23.9±2.4	3.9±0.2
I	11	832.7±105.0	1913±310	22.0±5.9	4.1±0.4
II	12	835.0±100.1	2038±136	24.5±3.2	3.8±0.3

### Effect on morbidity and mortality.

From Table 2 it is known that the cases of diarrhea and mortality of group II were similar in the three groups. It is identified that case of mortality in group I was caused by pneumonia.

**Table 2. Effect of dietary sacchariterpenin on infection of diarrhea and mortality**

Group	No. of diarrhea cases	Mortality
Control	5	1 (diarrhea)
I	5	1 (pneumonia)
II	4	0

## DISCUSSION

### Effect to growth of rabbit

Monose (monosaccharose) in sacchariterpenin can not be digested by intestinal digestive ferment but selectively utilized by microbe like *Bifidobacterium* and lactic acid bacterial, but not by salmonella and colon bacillus. In this way the beneficial bacterium numerously propagate in intestine. The increment of lactic acid, acetic acid, butyric acid, propionic acid by *Bifidobacterium* and lactic acid reduces intestinal pH, benefits intestinal health and improve solubility and absorption of calcium, magnesium, iron and copper.

Besides, the drop of intestinal pH improves peristalsis of intestine and stomach, appetite, nutrition absorption and feed efficiency. When monose in sacchariterpenin ferments by beneficial microbe, it produces butyric acid, which is the main energetic substance for clono mucosa to promote growth of colon, absorption of protein, B group and K group vitamin and the other external nutrients. And in turn to improve feed efficiency and reduce feed conversion ratio. For the group of control in the experiment, the additive was olaquinox, which is growth promoter of olaquinox compound and is broad spectrum antibiotic and popularly used in rabbit farming.

It is reported by LIANG QUANZHONG (1985) that the application of olaquinox increased daily gain 9.6% -21.0% and the similar results obtained with group II suggests that sacchariterpenin could be an effective alternative, which agrees with the report of TANG SHENGQIU (2002).

### **Effect to rabbit health**

When monose in sacchariterpenin was utilized by beneficial bacterium in intestine, numerous *Bifidobacterium*, lactic acid bacterial and *Pseudobacterium* propagate and then the produced lactic acid, acetic acid, butyric acid, propionic acid reduce intestinal pH, which results harmful influence to propagation of those acid-sensitive injurious bacterium and improve intestine environment. While the injurious bacterium like *Bacillus*, *Eubacterium* and colon bacillus they can't utilize or make very poor utilization (KOHMOTO *et al.*, 1991). Meanwhile cell wall of *Bifidobacterium* could stimulate cell-killing activity of abdominal cavity of macrophage, Nk cell and lymphocyte. *Bifidobacterium* is also an assistant to immunity to stimulate body to produce antibody and prolong antigen's effective duration.

All the above mentioned mechanism considerably improves immunity health statue of rabbit population. Although the number the observations is very small, when sacchariterpenin is applied in rabbit diet, cases of diarrhea infection and mortality is almost the same than in the olaquinox group. However, further works are required to confirm the actual results.

### **CONCLUSIONS**

The results of the experiment show that, compared with the use of olaquinox, the application of 200-400 ppm sacchariterpenin doesn't affect remarkably the daily gain and feed conversion ratio and health of growing rabbits.

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