

EFFECT OF ORAL ADMINISTRATION OF CARBARYL IN THE BLOOD OF GOATS

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ABSTRACT

A dose of 2mg/kg body weight was fed to the goats. The results of weekly morning and evening samples of milk, urine and faeces showed that carbaryl was present in all these excretions, and its amount progressively increased with the passage of time. Growth rate of goats was affected as there was significant decrease in the body weight of experimental goats as compared to control however no significant change was observed in body pH. Carbaryl is an insecticide having the following formula:

N-methyl, 1-nephthyl, 1-carbamate (Carbaryl) $C_{12}H_{11}O_2N$

INTRODUCTION

Use of pesticides have become increasingly popular to curtail the crop damage and losses during different stages of plant growth and also during transport and storage. These pesticides are sprayed on fruits and other edible crop. They penetrate into the crop as they are organic synthetic compounds which are readily soluble in plant oils and waxes and can be translocated through out the plant via phloem, xylem or both and are ultimately consumed by human beings. In continuation of the work reported earlier¹ the present project was undertaken to detect the effect of carbaryl on lactating goats.

MATERIALS AND METHODS

Six lactating female goats of approximately same body weight (15-15.3 kg) and of same age (11-12 months) were randomly divided into two groups control and experimental denoted as "A" and "B" respectively. Both the groups were fed the same diet throughout the study (green leaves, cotton seed cake and grains). In experimental group 2 mg/kg weight of carbaryl was mixed in the diet fed early in the morning daily. Weekly morning and evening samples of blood, milk, urine and feces were collected for eight weeks. Carbaryl was estimated in these samples by methods 2.3 and pH of blood was determined by pH meter (Labsco).

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RESULTS

The results of weekly morning and evening samples of blood, milk, urine and feces showed that carbaryl was present in all these excretions and its amount progressively increased with the passage of time. Blood level of carbaryl increased from 19.20 ug/ml at the end of first week to 100.04 ug/ml at the end of eight week period indicating an average increase of 12.05 ug/ml per week (Fig. 1). The excretion of carbaryl in morning and evening milk was 36.81 and 40.01 ug/ml respectively at the end of eight week. The excretion of carbaryl in the morning and evening urine sample was 20 ug/ml at the end of eight weeks but in feces no carbaryl was excreted at the end of first week while after that it also progressively increased and reached a maximum of 19.20 and 20.0 ug/ml in morning and evening samples at the end of eight weeks. The body weight of control group increased from 15.12 to 15.44 kg and in experimental group decreased from 15.15 to 14.99 kg (Tab-I).

DISCUSSION

Acceptable daily in-take of carbaryl has been recommended to be 0.01 mg/kg body weight by FAO/WHO⁴. It has also been reported by others⁵ that higher doses produced dose dependent changes which included increased heart and respiratory rate increased frequency of defecation, urination, depression, in co-ordination of movements, weakness, recumbence and finally death.

In the terminal stages decrease in RBC count, packed cell volume, and hemoglobin concentration was also reported. Other studies⁶ also showed increasing blood concentration of carbaryl with the passage of lime. Present study indicated a progressive increase of about 12.05 ug/ml per week in the blood level of experimental goats (Fig-I). Continued administration of much lower doses produced a chronic poisoning of neuromuscular type characterized by ataxia, recumbency and prostration⁷.

In present study no significant effect was seen on blood pH after administration of 2 mg/kg body weight of carbaryl. However significant change in blood pH has been reported⁸ with much higher doses of 4.4 mg carbaryl/kg body weight per day.

Table-1: Changes in the body weights of goats fed 2mg carbaryl per kg body weight daily.

B O D Y W E I G H T S (K g)		
Weeks	Control	Treated
1	15.12	15.15
2	15.2	15.13
3	15.26	15.09
4	15.3	15.08
5	15.34	15.05
6	15.38	15.04
7	15.41	15.02
8	15.44	14.99

Excretion of carbaryl in the milk also increased progressively in the experimental group (Tab 2). This increase was statistically significant ($P < 0.01$). Relative toxicity of maternal milk to neonates have been reported⁹, acute poisoning resulted in convulsions while chronic poisoning was associated with liver damage.

Progressive increased in the urine was also seen in the experimental group which increased progressively with the passage of time. It has been reported¹⁰ that 70-80 percent of the administered, carbaryl is eliminated in the urine within 24 hours as sulfates or glucuronides. In the feces no excretion of carbaryl was seen at the end of first week but later on excretion increased progressively. Experimental studies have shown that 30 to 40 percent of the administered carbaryl is excreted in the feces.

During this study comparison of control and experimental body weights showed a significant decrease in the body weight, the experimental group (Tab I). The results indicated that for every one microgram per ml accumulation of carbaryl in the blood results in corresponding decrease of 0.0018 kg of the body weight.

Table-2: Amount of carbaryl in the morning and evening milk of goats fed 2mg body weight daily.

AMOUNT OF CARBARYL (ugml-1)		
Weeks	Morning	Evening
1	4.00	6.40
2	6.40	9.60
3	8.80	12.00
4	13.60	20.00
5	19.20	23.20
6	23.20	29.61
7	29.61	36.01
8	36.81	40.01

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AMOUNT OF CARBARYL (mgm/l)

Time	Morning	Evening
1	13.60	13.60
2	13.60	13.60
3	13.60	13.60
4	13.60	13.60
5	13.60	13.60
6	13.60	13.60
7	13.60	13.60
8	13.60	13.60
9	13.60	13.60
10	13.60	13.60

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