Anticoagulants for the control of rats and mice

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LATELY there have been many requests for information on suitable poisons to use in baiting rats and mice. Most enquirers have stated that they "tried a certain brand of bait" and found that the rats only "ate it up and kept coming back for more."

This article on Warfarin—as a rat and mouse poison—is presented to clear up some of the problems of rodent poisoning.

About two years ago an article in the Journal of Agriculture dealt with rat and mouse control in terms of the animals themselves, public health hazards and control measures for the city dweller and the farmer.

The control measures dealt with were:

- Fumigation
- Exclusion
- Trapping
- Poisoning

If you are interested in these aspects of the problem I suggest you read the article which is available as Department of Agriculture Bulletin No. 2803.

WHAT IS THE BEST POISON TO USE?

There now seems to be only two main types of poison used in any quantity for rodent poisoning throughout the world. These are:

1.—The Sodium fluoroacetate group (including 1080).

These are not permitted for rat and mouse poisoning in Australia at present. However, they are used extensively by authorities in Great Britain and the U.S.A. in situations where the danger of their being accidently eaten by humans is negligible.

Although more spectacular in their effect on a rodent population, it is hard to say whether they are any more efficient for rat and mouse control than—

2.—The Warfarin Derivative group.

The average farmer or householder wanting to control rats or mice will search around for a bait material which will drop the bodies close to where the bait is laid. In this way he will be quite sure that he has at least killed some of the rodents. However this is not usually a good measure of success and probably means that he has missed killing most of the population.

Rats are intelligent animals with reasoning ability and when they see their companions dying near to the bait material
The brown rat (*Rattus norvegicus*) is common throughout the world. (Picture by courtesy H.M.S.O. England)

(and quick acting poisons generally produce violent reactions), they invariably move to some other feeding area. Warfarin does not cause a violent reaction in the animal, or death close to the bait. This is why it has been accepted throughout the world as the best poison for rat and mouse control.

**WHAT IS WARFARIN?**

The chemical name for Warfarin is \(3-(\alpha\text{-acetonylbenzyl})-4\text{-hydroxycoumarin}\). This indicates that it is a relative of dicoumarol—a compound well known for its effect on the clotting of blood.

In the presence of dicoumarol, clotting time is greatly increased. Warfarin has exactly the same effect on all warm blooded animals (or birds) which eat it. If eaten over a period of days the rate of clotting is gradually reduced.

Clotting is not only important for the healing of external wounds, but also for repair of the numerous tissue breakdowns and degenerative processes which occur in the body. If blood clotting is weakened by the presence of dicoumarol (or Warfarin) to the point where it cannot continue, then the animal simply bleeds to death internally. The end result is much the same as that produced by anaemia—it is slow and painless as far as man can ascertain. The animals go away to die quietly and do not upset the remaining population, which carries on eating until they too succumb to the poison.

**HOW IS WARFARIN USED?**

For the warehouse keeper or person with a big area to treat, there is a concentrated form available which can be mixed with 20 times its own weight of a carrier such as crushed cereal grain. For the average householder, proprietary lines containing Warfarin are available through most general stores and stock agents.

It is impossible to say without some knowledge of the layout of the area to be
treated, and the rodent population, how much bait material should be used. As with most sedentary animals and birds, each family group of mice occupy and seldom move out of a well defined territory. All their feeding is generally done within this territory, which may be quite small—in fact only a few square yards in area. This fact becomes most important when planning the distribution of baiting points. Unless the bait is available within the feeding range or territory of every rodent some will escape.

In ordinary households it is suggested that 2 to 4 oz. of bait be placed in each room where the pests are known to exist. The baits should be examined every morning and if all the bait has been eaten then the quantity should be doubled. After two or three days it should be possible to determine how much bait is needed at each point.

In storage rooms or sheds it has sometimes been found that more than one baiting station is needed; common sense will usually tell you how many should be used. Bait should be taken from the points where it is not eaten and removed to another locality.

It is most important to treat the whole area simultaneously to prevent reinfestation from adjoining parts of the establishment.

To calculate the amount of bait to buy it can be assumed that one mouse will eat up to 2 oz. and one rat about half a pound of bait before it dies. It is obvious that the householder who buys only a 4 oz. packet to treat a home or shed overrun with mice is doomed to failure. If rats are present the position is even more ludicrous.

**HOW LONG TO POISON**

It takes about five to seven days to kill the pests. A single massive dose of Warfarin would probably have little effect, whereas a small amount eaten each day for five to seven days will kill. This is the most important point for householders and other users of Warfarin bait to remember.

Warfarin bait should be left exposed until all feeding has stopped. Some people make it available to the rodents at all times so that any new influx of the pests can feed as soon as they enter the premises.
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**IS WARFARIN DANGEROUS TO HUMANS, STOCK OR PETS?**

All warm blooded animals or birds will be killed if they eat enough Warfarin over a period of time. There is little danger of stock being poisoned unless they are housed in barns or sheds where bait has been laid.

There are several known cases of dogs and pet birds being poisoned by Warfarin. Dogs which are fed regularly on dog biscuits or meal are specially susceptible as they already have a liking for cereal products. The danger to dogs and cats should not be overlooked. There is no doubt the danger exists, especially when treating large infestations of rodents.

Free flying budgerigars and cockatoos should also be safeguarded.

The danger to humans can be practically eliminated if the bait is put out of reach of children. Safe places are behind cupboards, under temporary shields nailed to the wall or skirting boards, or in boxes with small entrance holes.

Children or pets must eat the bait daily over a period of time for it to be dangerous. Even in large quantities a single dose would have little effect. This is why Warfarin is considered the safest bait now in use.

**CAUSES OF BAITING FAILURES**

Baiting failures can usually be put down to one of three reasons. These are:

- Baiting time was too short and not enough was eaten for it to be effective.
- Not enough bait was put out for each rodent to get enough to kill it.
- Not enough baiting points were used simultaneously and almost immediate reinestation occurred from other over-populated regions close to the baited area.
IN BRIEF

Warfarin is the best rat and mouse poison now available in Western Australia. It has achieved outstanding success throughout the world and is used in nearly every country where rats and mice are an economic problem; mostly against exactly the same species as we have in Australia.

Until 1080 or some other improved rodenticide becomes available for rodent control, Warfarin will be used in one form or another as our major poison against these pests.

Because of its characteristic of slowly creeping up on its victim and taking him by surprise, it does not cause bait shyness. This is important in the poisoning of any pest animal.

The danger to humans can be minimised and practically eliminated if the bait is only exposed in places that are out of the reach of children. It does constitute some danger to pets but this can also be reduced by sensible handling and adopting the general precautions printed on the label.

Stocks can be obtained from departmental or general stores and stock agents.

If your experience with Warfarin poison has not been satisfactory it was probably because the bait was not applied correctly.

If you are worried again by rats or mice, give Warfarin another try, but this time be sure to—

- Treat the whole affected area simultaneously.
- Have enough baiting points so that all the rodents can find the bait material readily.
- Use enough bait to satisfy each animal’s appetite each day.

Remember—the bait should be left out for at least five to seven days.

If these rules are carried out you will obtain good results from Warfarin.

ACKNOWLEDGMENT

Pictures by permission of H.M.S.O. England.
From “The West Australian,” Monday, 29th April, 1963:

“Thieves started a fire which caused damage to Parrys Department Store, Sutherland Street, West Perth, early yesterday when they tried un成功fully to blow open the firm’s safe . . . The explosion set fire . . . Within minutes the building was almost engulfed in flames. Furniture, television sets and electrical goods including stoves, radios and refrigerators, were destroyed in the blaze . . . was partly covered by insurance. About 50 per cent. of the stock had been saved and the store would be open for business today . . . Records of customers’ orders had been destroyed . . . spent yesterday salvaging undamaged goods.”

The Principals of Parrys Department Store wish to thank the many friends who called and came to help after the fire.

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