CONTROL OF RATS AND MICE

The Brown or House Rat*

The most formidable and the most widely distributed of the species of rodents which are destroyers of food is the common brown or house rat. It invades houses, stores, warehouses, and markets; and besides destroying fabrics and leather goods, it attacks all kinds of food—grains, meats, groceries, fruits, vegetables, etc. In town and country it attacks poultry, destroying eggs and chickens. The foundations of buildings, also, are damaged by its activities. Everywhere it destroys unceasingly, and yet its presence is tolerated.

Besides the enormous destruction of food supplies, the brown rat is a serious menace to public health. It is a carrier of bubonic plague, one of the most devastating of human diseases, which has been carried by the rat all over the world. In the fourteenth century it is estimated that about twenty-five million people died in Europe from the "Black Death," as this disease was called, and two million deaths are stated to have occurred during the epidemic of the plague in India in 1907. Bubonic plague is transmitted from rats to human beings by fleas, and modern methods of preventing the spread of plague involve the most vigorous eradication of rats and the prevention of their landing in seaports from ocean-going vessels. Typhus fever, too, is harboured by rats and may be transmitted to man through the medium of the rat louse. The serious disease known as trichinosis, caused by the Trichina worm, affects rats. From this source pigs may become infected, and the organism be transmitted to man when imperfectly cooked flesh from diseased animals is eaten.

* *Rattus norvegicus* (Erxleben).

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Control of Rats

Rats should be denied access to places where they obtain food and rear their young. To accomplish this, buildings should be made rat-proof; the best construction material for this purpose is concrete. In the construction and maintenance of buildings in which food is kept and rats are likely to find lodgment, special attention should be paid to the closing of all openings, especially in foundations where drain and other pipes enter. Doors to such buildings should be bound with strong sheet-metal, and ventilators and basement windows should be protected and kept in good repair. Constant vigilance should be exercised with a view to checking any inroads of these pests; the holes of rats or mice can be stopped readily by a little concrete, broken glass or crockery. Concrete should be used for foundations of all kinds of storehouses, granaries, poultry houses, etc. Corn cribs can be rendered rat-proof by enclosing them in heavy galvanized wire netting of half-inch mesh. Foodstuffs should be kept in containers through which rats cannot gnaw, and storerooms should always be made rat-proof by the adoption of the foregoing constructional methods. It is also important to deny rats access to water or other liquids in buildings. Such drinking sources as cannot be removed may serve as good sites for placing traps or poisoned bait.

Civic authorities, and particularly the health authorities, should adopt and enforce sanitary conditions in towns and cities. Cleanliness and the prevention of the accumulation of refuse and garbage are essential in the eradication of rats. Such materials should be kept in rat-proof metal containers until disposed of, preferably by burning. Garbage dumps are an important source of rats and also of flies, both important agents in the spread of disease. The only proper method of disposing of garbage is by burning.

An excellent method of destroying rats, especially in barns and outbuildings, is the use of poisoned baits. *Great care, however, must be exercised in the use of poison, to prevent food from becoming contaminated or other animals from eating it.* It is inadvisable to use poison in dwellings, not only on account of its dangerous properties, but because the occurrence of inaccessible corpses of the rats is likely to prove objectionable.

One of the most satisfactory poisons to use is finely ground red squill. Although deadly to rats when properly applied, this material has the advantage over other commonly used raticides in that it is relatively harmless to humans and domestic animals. Chopped fresh fish, canned fish, freshly ground meat, and cereals such as oatmeal, corn meal or bran, are recommended as baits. In preparing the fish or meat baits, mix one ounce of powdered red squill with enough water to make a thin paste without lumps, and add this to one pound of the fish or meat and mix thoroughly. In making a cereal bait, mix one ounce of dry red squill with one pound of cereal and then add one pint of sweet milk or water, stirring thoroughly.

It is recommended that fish, meat, and cereal baits be used at one and the same time, to ensure that all the rats are attracted and eat of the poisoned material. Before distributing the baits an attempt should be made, in so far as possible, to remove or cover other sources of food available to the rat. The bait should be put out in late afternoon, in small portions about the size of a marble, in and about places frequented by the rats. After the lapse of three days, uneaten baits should be collected and destroyed. If, after an interval of three weeks, surviving rats are still noted, distribute baits identical with those described above, without the addition of red squill, at two-day intervals, to renew the confidence of the rats. When it is seen that these latter are being eaten readily, all uneaten portions should be removed and fresh baits substituted containing red squill. If the rats continue to reject the red squill baits after the initial poisoning, it would be advisable to use a different poison or adopt other measures such as trapping.

Barium carbonate is another commonly used rat poison, and is second in value only to red squill. Although less poisonous than arsenic, it should be handled with care. It is inexpensive, odourless, and tasteless. Baits may be prepared by mixing one part of the poison to four parts of food such as meal or flour, adding sufficient water to form a dough.

Arsenic is used in many rat poisons. This, also, is odourless and tasteless, but is more deadly than barium carbonate. Best results are secured by using a very fine grade of arsenic. A good bait is prepared by mixing thoroughly one tablespoonful of finely powdered white arsenic with one pound of oatmeal and one pound of coarse brown sugar. Another formula is: arsenic, two ounces; canned salmon, one pound; cornmeal, one pound. The ingredients should be thoroughly mixed, so that the arsenic is evenly distributed throughout the bait. Arsenic has also given good results when mixed with glycerine. One method reported successful is to dissolve one-quarter of an ounce of white arsenic in five ounces of hot glycerine and to spread this solution thinly on slices of bread. When preparing and distributing these baits, every precaution should be taken to avoid exposing them where they may cause the accidental poisoning of humans, pets, or live stock.

Phosphorus is a common ingredient of rat and other animal poisons, but, owing to the danger involved in mixing it and in the subsequent use of the home-made or commercial preparations on account of its inflammability, its use as a rodent poison is not recommended. Strychnine, although a virulent poison and widely used against rats, has been found unsatisfactory. Thallium is reported to be very effective, but is too dangerous to be recommended for home-made mixtures.

Dusting the floors of infested premises such as warehouses with sodium fluosilicate (silicofluoride) once a month has also been reported to be efficacious in controlling rats. Runways in which to place the material may be made of eight-inch boards tilted against the walls. Rats like such places in which to run and hide. The sodium fluosilicate adheres to their feet and is licked off. In this way the rats become poisoned. It should be borne in mind that this material is poisonous to humans as well as to animals, and care should be taken to avoid contaminating foodstuffs.

Traps are very useful for killing or capturing rats in dwellings or in other places where only a few are present. When rats are numerous, it is preferable to use poisoned baits and to resort to traps only as a final clean-up measure. The best traps are those of the spring or guillotine type. Such traps may be baited with any of the foods preferred by these animals, such as meat, fish, oatmeal, cooked eggs, or fruit. It is necessary to use a large number of traps, unless the rats are few. Wire cage traps also are excellent when rats are abundant. Several other effective types of traps are available. Spring traps may be used effectively without bait by placing them in runways formed by leaning boards against walls and covering the traps with a piece of cheesecloth, sawdust, or other light material to obscure them.

Rats may be destroyed in their burrows by means of calcium cyanide. This material, which is sold in dust and granular form, generates hydrocyanic acid gas when exposed to the air. Both the cyanide and the gas are extremely poisonous to humans, as well as to rats and other animal life, and should be used only by competent persons fully aware of their dangerous properties and in accordance with any provincial or local regulations that may be in force. The calcium cyanide may be placed in the burrows with a spoon, but best results are obtained by using a dusting pump. All but one of the entrances to a series of burrows should be tightly plugged to retain the fumes, and after the material has been forced in, the remaining hole should be sealed. In using this gas against rats the directions of the manufacturer should be carefully followed.

Carbon monoxide gas can also be used in gassing rat burrows. This may be done by directing the exhaust fumes from a gasoline engine into the entrance of a burrow by means of a hose, after carefully sealing other exits with earth. The engine should be run at moderate speed and the fumes passed into the burrow for about ten minutes, afterwards sealing the hole. This gas, too, is very poisonous to human life.

The Common House Mouse*

This common household pest needs no description, nor is it necessary to take space to discuss its habits. Householders are only too familiar with the damage it causes and the kinds of food to which it is specially attracted. Like the brown rat, it came to North America from abroad.

Control of Mice

The precautionary measures and the methods of poisoning and trapping recommended in connection with the control of rats are also effective against mice. Poisoned baits should be used only with great caution, and in smaller quantities than in the case of rats. In dwellings it is advisable not to use poison, but to eliminate the mice by means of traps. The well-known guillotine type of trap is most satisfactory. Such traps may be baited with cheese, fried bacon, raw meat, oatmeal or fruit. A combination bait very often used is a mixture of peanut butter, rolled oats, and chopped raisins. A drop or two of aniseed oil may be added. This bait has been found to be very attractive to all rodents. If the animals are abundant, a number of traps should be used and arranged in places which the mice are known to frequent.

Deer Mice and Field Mice

There are several species of deer mice and field mice which cause injury to orchards and crops and which infest outhouses and barns, damaging grain and other products stored therein. These creatures sometimes enter dwellings and feed upon foodstuffs attractive to the common house mouse. The measures outlined for the control of rats and the common house mouse would also be effective against these species.

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* *Mus musculus* L.

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