

# Rodenticides

Professional Rodent Control



Only a complete program ensures success.

# RODENTS. INTELLIGENT DANGER.

## COMMENSAL RODENTS AND THEIR WORLDWIDE INVASION.

Commensal rodents have accompanied the evolution of human culture and adapted to human living spaces. Human shelter offers food and hiding places for protection from both weather and predators. The high intelligence, adaptability and fertility of the animals has allowed them to spread out into practically every human habitat throughout the world.



In general, three types of rodents are responsible for damage: the Norway rat, roof rat and house mouse. In addition to stored product damage, that is, the quantitative loss of food-stuffs, health risks also pose a threat. These rodents can transmit a number of pathogens to both people and their livestock.

This is why targeted, professionally-applied control measures for the reduction and elimination of rodent populations are essential.

## WHERE DON'T YOU FIND RODENTS?

Their well-known ability to adapt and survive mean that rats and mice can be found practically anywhere:

- ▶ Private apartments, single and multiple family homes, where they find food in kitchens, garbage containers and garden compost heaps.

- ▶ Commercial operations such as food stores, bakeries, butchers, restaurants, etc., where food is stored, processed and prepared.

- ▶ Industrial food and feed enterprises, including bread and meat production facilities, slaughterhouses, dairies, grain storehouses, feed mills, etc.

- ▶ Farming operations.

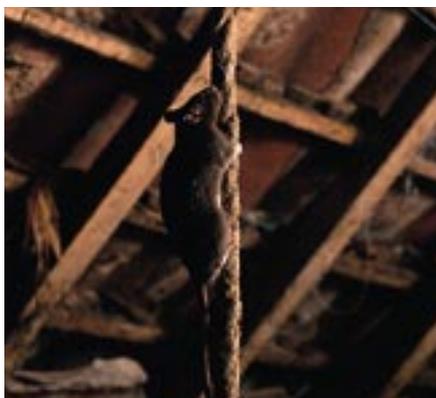
- ▶ Open areas such as ports, train tracks and stations, composting plants and community disposal facilities. i.e. sewage plants and dumps.

Rats often wander through very different environments in their search for food or new living spaces. In doing so, they make serious epidemiological links, for instance, between bacteria-infested sewers and the living spaces of people or animals.

# REQUIRES INTELLIGENT CONTROL.

## HOW CAN WE CONTROL THE MOST INTELLIGENT OF PESTS?

Considering how intelligent and adaptable mice and rats are, it is no surprise that effective and sustainable control of these pests is extremely difficult to achieve. Since we have no direct access to the animals, they have to be lured by an appetizing bait. Such baits contain a rodenticide ingredient which should not be detectable to the rodents through taste or symptoms. This objective can only be met by means of carefully chosen bait formulations and baiting techniques.



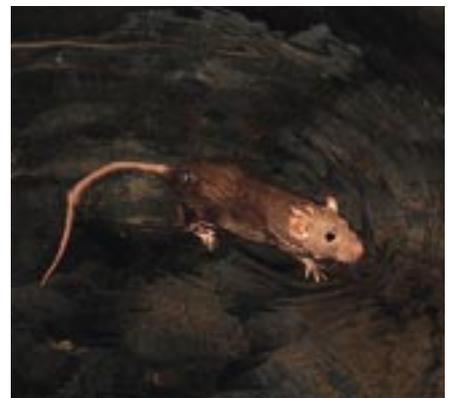
Sustainable pest reduction is only possible if control measures are chosen according to an Integrated Pest

Management concept, taking the environment of the pest into consideration as well as various control methods. A major element of IPM is the prevention of infestations which includes the following activities:

- ▶ Maintain cleanliness in infested areas in order to eliminate hiding places and sources of food.
- ▶ Dispose of refuse in a rat-proof way.
- ▶ Keep food sealed in appropriate containers.
- ▶ Cover vents, sewage pipes, drains, etc. with screens.
- ▶ Consider construction projects to make it more difficult for rodents to access the areas to be protected.

IPM programs require detailed assessment of the pest species, the extent of the infestation and economic impact before a program is implemented.

In the majority of cases, bait formulations are used which contain anticoagulants which keep blood from clotting. These baits have a delayed



effect, so they take effect a few days after being consumed in order to prevent bait shyness. The active ingredients in "second generation" anticoagulants are potentially highly toxic, making them effective against resistant mouse populations as well. Many of these products may only be used inside buildings (see label instructions), however. To control in open areas, increasingly, only formulations containing active ingredients from the "first generation" are being officially approved and applied.

Bait must be placed in covered containers or special bait stations such that accidental ingestion by children

or pets is prevented. Particular attention should be paid to the location of the bait stations: use tracks and evidence of feces to locate hiding places, favored routes and burrows in order to place a sufficient number of stations next to the pathways between the hiding place and food source. The bait stations should be protected in corners or against walls, yet placed so that the entrances and exits to the stations are not obstructed. The bait stations should be monitored and refilled frequently, depending on the size of the infestation. Since not all rats will immediately eat bait, it should be left in place for at least one to two weeks. When performing mouse control, be sure to place the bait stations as close as possible to the nests, since these rodents only move within a small radius of their homes. For this reason, bait stations should be placed two to three meters apart as called for by the locations of the infestations.

### **RACUMIN AND RODILON\* FOR A QUICK AND LASTING SOLUTION**

Bayer offers the perfect products for every application need, allowing professional, effective rodent control:

► Racumin, a rodenticide based on the "first generation" anticoagulant Coumatetralyl, specifically developed for rat control and

► Rodilon, containing the highly-potent "second generation" active ingredient Difethialone, effective against both rats and mice.

All formulations are characterized by high palatability and effectiveness.



### **RACUMIN GRAIN BAIT**

This ready-to-use mixture is made of various, carefully selected local grains, offering the rats the food

they are accustomed to. The bait can be applied universally and mixing is unnecessary.



### **RACUMIN TRACKING POWDER**

In some cases, it is best to choose specific bait materials (fish or meat products, nuts, sweets, etc.). Here, bait material is mixed in a ratio of 19 to 1 with Racumin Tracking Powder, and then applied.

Using the tracking powder alone along pathways and in front of burrow entrances is also an option: the animals contaminate themselves with the powder by ingesting it while cleaning their fur.



### **RACUMIN PASTE**

With this special formulation, the active ingredient is embedded in an oily bait matrix in order to make it resistant to outdoor conditions. The paste is highly attractive to rats and is preferred for use

in damp areas such as compost heaps, garbage dumps and sewers as well as other problem areas where the effectiveness of other formulations is often limited.



### **RACUMIN LIQUID**

This liquid formulation is simply mixed with drinking water and makes for an economical alternative to feed baits.

Rats need water every day, making Racumin Liquid perfect for application in dry areas such as mills, warehouses, silos, etc.



### **RODILON PELLETS**

This bait formulation is made of various foodstuffs, which ensures high palatability and acceptance by rats and mice

alike. The form and texture of the pellets were designed to respond to the needs of rodents to gnaw.



### **RODILON BLOCKS**

These weather-proof blocks are suitable for control activities in warmer climates,

especially where relatively high humidity prevails.

\* Rodilon has not been approved in all countries. Brand names may differ by country.

## RODENTS ARE COMPETITORS FOR OUR FOOD AND THREATEN THE HEALTH OF PEOPLE AND LIVESTOCK.

Rats and mice can thrive on a wide range of foods – they eat and chew on just about anything available to them, including food of all kinds.

According to estimates from 1995, year for year, some 10 billion rats worldwide consume about one-fifth of the total food and feed supply.

What’s more, foodstuffs are contaminated with feces, urine, saliva and hair, making them unfit to eat.



Rodents also damage many materials in warehouses and other buildings, such as packaging, sacks, doors, floors and insulation as well as power lines and electric cables, which can often lead to a short circuit or even fire.

The health risks presented by rodents are particularly serious. They act as reservoirs and vectors of a myriad of diseases, some of which are listed in Table 1.

**TABLE 1: DISEASES DIRECTLY OR INDIRECTLY CAUSED BY RODENTS**

Disease (pathogen)	Mouse	Rats
<b>Bacteria:</b>		
Typhoid, paratyphoid, enteritis (Salmonella spp.)	+	+
Shigellosis (Shigella spp.)		+
Plague (Yersinia pestis)		+
Cholera (Vibrio cholerae)	+	+
Tularemia (Francisella spp.)	+	+
Botulism (Clostridium botulinum)	+	+
Weil's disease (Leptospira icterohaem.)	+	+
Rat-bite fever (Streptobacillus moniliformis)		+
Campylobacteriosis (Campylobacter jejuni)		+
Borreliosis (Borrelia burgdorferi)		+
<b>Viruses:</b>		
Rabies (Rhabdo viruses)		+
Hepatitis (Hepatitis viruses)		+
Hemorrhagic fever (Hanta viruses)		+
Foot-and-mouth disease (Toga viruses)		+
Swine fever (Picorna viruses)		+
Aujesky's disease (Herpes viruses)		+
<b>Protozoa:</b>		
Toxoplasmosis (Toxoplasma gondii)		+
Leishmaniasis (Leishmania spp.)		+
Chagas' disease (Trypanosoma cruzi)		+
Pneumocystosis (Pneumocystis carinii)		+
<b>Parasitic worms:</b>		
Trichinosis (Trichinella spiralis)		+
Echinococcosis (Echinococcus multilocularis)	+	

In most cases, bacteria are spread passively that is, the pathogens are contained in infested urine, feces and saliva. In this way, food, feed and kitchenware can be contaminated with pathogens by mice and rats.

If this danger is not recognized and contaminated foods are eaten, serious illness such as salmonella poisoning can result. In other cases, the rodents act as pathogen reservoirs, bringing arthropods such as fleas, ticks or mosquitoes into the infection chain, as with diseases such as plague, borreliosis, leishmaniasis, etc.

**TABLE 2: INFECTION CHAIN IN WHICH RODENTS CAN PASS ON PATHOGENS TO PEOPLE AND LIVESTOCK**

Reservoir	Transmission/Vector	Host	Pathogen
rats/mice	contaminated food	people/livestock	Salmonella spp.
rats	contaminated environment	people livestock	Salmonella typhimurium, Leptospira icterohaemorrh., Toga, picorna, herpes viruses
rats	fleas	people	Yersinia pestis
rats	ticks	people	Borrelia burgdorferi

In addition to the vast economic losses of stored products and building materials through rodents, and the price of treating these health problems, the expenditure needed to control the rodents year upon year, should also be taken into consideration. Worldwide, these costs are climbing into the billions.



# A full line of products for full-scale control.

