

Food Preference Behavior of Field Rodents in Natural Environments

T.R. Kapoor and Girish Chopra

Zoology Department, Kurukshetra University, Kurukshetra 136 119, India

Abstract: Rodents consumed, in variable amounts, all the eight foods offered to them in bait boxes in multiple choice in all the three natural habitats. This points towards their neophilic behavior to the baits and bait boxes. Food preference behavior of rodents in natural environment indicated that cracked wheat was the most preferred and acceptable bait in all the three habitats, i.e., paddy fields, wheat fields and waste lands. Wheat flour, wheat flour+oil+gur and pearl millet grains were almost equally consumed by rodents and these were the next in preference after cracked wheat in these habitats. Maize grains were the least favored of all the eight food items offered in bait boxes in multiple choice.

Key words: Field rodents, feed, baits, behavior, grain.

Rodents are known to cause huge losses to food grains both in the fields and storage (Prakash and Ghosh, 1992; Chopra *et al.*, 1996). For their control, trapping as well as use of chemicals, particularly the acute rodenticides and anitcoagulants, are the most prevalent methods throughout the world (Chopra *et al.*, 1996). For applying these methods, there is a need to select appropriate bait material which is acceptable to predominant rodent species. Present study was, accordingly, designed to evaluate food preference behavior of field rodents in their natural environment.

Materials and Methods

Three (one acre sized) fields each of wheat and paddy, and also three waste land sites were selected in different villages in erstwhile district of Kurukshetra. These areas had substantial populations of *Rattus melta*, *Bandicota bangalensis*, *Mus* spp. and *Tatera indica*.

In each field, eight permanent bait stations were placed, 2-3 m apart, near rodent burrows. In these bait boxes 50 g each of the eight food items namely, wheat grains, maize grains, pearl millet grains, paddy, cracked wheat, wheat flour, wheat flour + 2% oil + 2% gur (jaggery) was placed individually every day. After 24 hours unconsumed bait materials were collected and fresh baits were replenished. To avoid place preference, food items were rotated orderly in bait stations daily.

Prior to experimentation, these food items were presented in mixed form in the bait boxes for five days for rodents to become familiar with them. Food preference trials were conducted between 10 and 12 weeks after sowing (WAS) in wheat and 8-10 weeks after transplantation (WAT) in paddy fields.

Results and Discussion

In spite of the fact that natural foods were freely available to the rodents in the

fields, they consumed all the eight food items, though in variable amounts, offered in bait boxes in all the three habitats (Table 1). It points towards rodents' neophilic behavior to the baits and bait boxes. Initial avoidance, if any, of these bait boxes (new objects) in the familiar environment of field rodents, must have vanished during pre-baiting of rodents in these boxes prior to actual experimentation. These findings are in agreement with those of Bohills *et al.* (1982) who reported that foods presented in specially designed bait boxes attract rodents away from their natural food supply. Acceptance of baits from bait boxes has also been advocated by Parshad *et al.* (1986) and Chopra (1992).

Results of multiple choice tests in natural conditions indicated that cracked wheat was the most preferred bait in all the three habitats. However, other baits were also eaten by rodents in variable amounts (Table 1). Such sampling behavior of rodents has survival value as it enables them not only in finding new sources of food, but also in avoiding toxic baits (Barnett, 1966; Siddiqui and Khan, 1982; Chopra *et al.*, 1996).

Numerous reasons have been assigned for bait preference of rodents. The food eaten is determined by what is available in a particular area. However, other factors like early feeding experience (Galef and Clark, 1971; Naganuma *et al.*, 1973), energy value, water content, special physiological effects, flavors, texture and even social interactions (Naganuma *et al.*, 1973; Khan, 1974; Barnett and Prakash, 1975; Siddiqui and Khan, 1982; Jain *et al.*, 1992) are observed to have influence on food preference behavior of rodents.

In all the three habitats, i.e., wheat fields, paddy fields and waste lands, whole maize cereal was the least consumed bait item (Fig. 1). Preference of cracked or dough forms of food over hard, whole cereals like maize has been reported in case of *B. bengalensis* (Kamal and Khan, 1977) and *R. melta* (Chopra *et al.*, 1984).

Given the choice, the rodents prefer soft, finely divided, flavored foods over other available alternatives (Rana *et al.*, 1992). In the present experiments too, cracked wheat or wheat flour mixed with gur and

Table 1. Average daily intake of different food items by rodents in three habitats

Food items	Average daily intake (g) per bait station \pm S.E.		
	Wheat crop	Paddy crop	Waste land
Wheat	13.17b \pm 0.45	14.12b \pm 0.21	14.15b \pm 1.01
Maize	9.33a \pm 0.36	11.18a \pm 0.37	10.16a \pm 0.68
Bajra	15.21c \pm 0.46	15.59c \pm 0.91	14.35b \pm 0.36
Paddy	13.98b \pm 0.67	15.68c \pm 1.52	16.18c \pm 1.23
Wheat (C)	18.36e \pm 0.29	16.79c \pm 0.45	18.93d \pm 0.26
WF (Wheat flour)	15.44c \pm 1.21	15.80c \pm 0.75	16.89c \pm 0.07
WF + gur	15.72c \pm 0.95	15.88c \pm 0.48	15.94c \pm 0.62
WF + gur + oil	16.94d \pm 0.80	16.38c \pm 0.05	16.84c \pm 0.29
C.D.	1.08	1.28	1.24

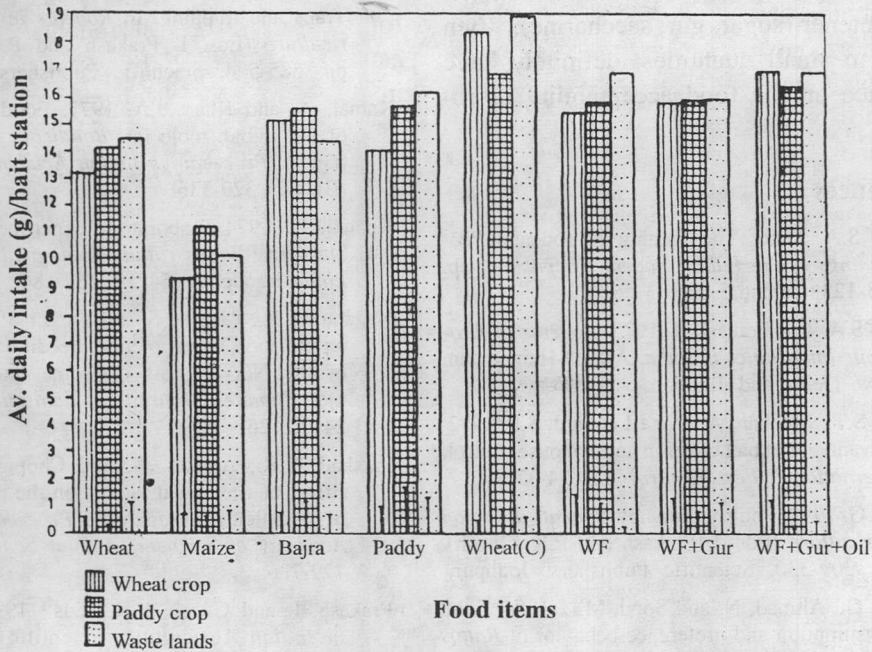


Fig. 1. Average daily intake of different food items in natural environment i.e., wheat fields, paddy fields and waste lands.

oil or pearl millet cereal (soft food) were comparatively favored over hard, whole cereals such as maize, wheat and paddy (Table 1).

Seasonal variations too have an impact on food preference behavior of rodents (Jain *et al.*, 1992). In the present trials too, food preferences of rodents changed in different seasons. In wheat fields, during winters, rodents preferred food items in the order: cracked wheat > wheat flour + gur + oil > wheat flour + oil, wheat flour, pearl millet grains > wheat > maize. In the waste lands with only weeds around and surface soil totally dry, the preference of rodents changed (Table 1). Cracked wheat was the most preferred food item, followed by equal preference

for wheat flour as well as wheat flour + additives. Pearl millet grains and wheat grains were the third in preferential order while maize was the least preferred food item.

According to Jain *et al.* (1992), role of additives such as vegetable oils with no marked taste lies more in making the powdered poison particles adhere to the bait rather than to increase its acceptability. Likewise, sugar or saccharine have no significant effect on the intake of bait, particularly in natural conditions. However, in the present field trials, wheat flour when mixed with 2% gur and 2% oil was found to be the second best favored food item by the rodents in wheat fields and waste lands, and equally best favored food in

paddy crop. Therefore, additives like oil or sweetener (sugar, gur, saccharine), when added in small quantities, definitely have influence on the food acceptability of rodents.

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