

# AN EVALUATION OF FOOD ADDITIVES PREFERENCE BY *MUS MUSCULUS* (ALBINO)

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## ABSTRACT

*Investigations carried out against Mus musculus (albino) reveal that jowar (Sorghum vulgare) or wheat (Triticum aestivum) flour containing 1% groundnut oil and 1% gur is the most preferred bait for this species. It was also observed that when the additives were used in different combinations, the consumption was significantly ( $P < 0.001$ ) higher than that with individual additive or without them.*

## INTRODUCTION

Various rodenticide baits have been formulated to keep a check on the ever increasing rodent population. To render the bait readily acceptable, it is essential to evaluate the best carrier of poison with preferred additives so that it may be consumed in large quantity as a result of which the lethal dose of poison is ingested (Prakash, 1976). It will ultimately result in higher mortality leading to effective rodent control.

Gustatory (taste) and olfactory (odour) additives or a combination of both have received much attention (Shumake, 1978). Some food or taste preferences are innate, while others relate to rodents, early and subsequent experiences in life. The food consumed by the mother while nursing the young may influence future food preference of the offspring (Galef & Clark, 1972).

## MATERIAL AND METHODS

### Multiple choice Test with Flours

Twelve healthy, adult, individually caged mice of both the sexes were tested with four commonly available cereal flours viz Jowar (*Sorghum vulgare*), Wheat (*Triticum aestivum*), maize (*Zea mays*) and Gram (*Cicer arietinum*). Each mice was given four baits of these cereals for seven days. The baits were replenished every day and water was provided *ad libitum*. The daily consumption was recorded and converted from absolute the g/kg body weight for comparison purpose. The percent intake and palatability index were computed.

### Additives Preference test

Five additives i.e. Groundnut oil (*Arachis hypogea*), Soyabean oil (*Glycine max*), til oil (*Sesamum indicum*), sugar and gur were added individually and in combination to most preferred flour of previous test and provided to each individually caged mice in single choice test for seven days. The control set of animals received the flour bait only without any additive. The total daily intake was measured and converted into g/kg body weight.

## RESULTS AND DISCUSSION

Test (I): Results reveal that in multiple choice test with flours (Table I), jowar was the most preferred flour and the second place was occupied by wheat. These were followed by maize and gram. The difference between the consumption of jowar and wheat was non-significant ( $P > 0.05$ ), while with gram, it was found significant ( $P < 0.01$ ) and almost significant ( $P < 0.005$ ) with maize. The preference was recorded as follows : Jowar > Wheat > Maize > Gram.

**Table 1. Food preference of *Mus musculus* (Albino) with flours (Multiple choice test)**

Flour Bait	Average Daily intake (g/kg body weight)	Percent intake	Palatability Index
Jowar	102.95 ± 9.61	38.68	1
Wheat	83.16 ± 7.26	31.25	2
Maize	53.75# ± 12.26	20.19	3
Gram	26.28 * ± 8.62	9.87	4

# P < 0.01 (significant) \*P < 0.05 (Almost significant)

Test (2) : It can be concluded from Table II that when the additives were mixed individually with jowar flour (the most preferred flour), the first rank was secured by jowar + 1% til oil followed by jowar + 1% groundnut oil. However, the addition of 1% sugar, 1% gur and 1% soyabean oil resulted in decreased consumption.

**Table II. Preference of different additives by *Mus musculus* (Albino) (Single choice test)**

Baits	Average daily intake (g/kg body weight)	Preference
Jowar (Control)	201.34 ± 0.91	-
Jowar + 1% Groundnut oil	245.83 ± 8.16 *	2
Jowar + 1% Soyabean oil	186.46 ± 15.60	5
Jowar + 1% Til oil	263.63 ± 0.96 *	1
Jowar + 1% Sugar	194.21 ± 11.93	4
Jowar + 1% gur	194.87 ± 4.80	3

\*P < 0.001 (High significant).

When these additives were tested in various combinations (Table III), a significant increase in consumption was recorded in all the cases.

**Table III. Preference of different additives (in combination) by *Mus Musculus* (Albino) Single choice test)**

Baits	Average daily intake (g/kg body weight)	Preference
Jowar +1% Groundnut oil + 1% Sugar	262.13 ± 2.86 *	4
Jowar + 1% Groundnut oil + 1 Gur	275.83 ± 3.23	1
Jowar + 1% Soyabean oil + 1% Sugar	248.84 ± 11.68#	6
Jowar + 1% Soyabean oil + 1% Gur	262.54 ± 3.81	3
Jowar + 1% Till oil + 1% Sugar	272.63 ± 2.96	2
Jowar + 1% Till Oil + 1% Gur	259.25 ± 1.84	5

\*P < 0.001 (Highly significant) #P < 0.01 (Significant)

The addition of 1% groundnut oil and 1% gur to jowar flour was ranked first followed by 1% til oil +1% sugar and 1% Soyabean oil + 1% gur.

It is evident from the results that jowar is the most preferred flour. But it cannot be ignored that there was non-significant difference between jowar and wheat intake. Therefore both of these can be used as poison carrier. Prakash et al. (1980) reported the preference of wheat and bajra by *Rattus rattus rufescens* in various textures while Saxena et al. recorded that bajra and wheat flours were preferred most by *Meriones hurrianae*.

The test with additives reveal the 1% groundnut oil + 1% gur increase the consumption significantly and is the best among various combinations. The preference of groundnut oil to other oils was also reported by Sridhar & Sridhari in case of *Bandicota indica* and Sharma & Saxena in case of

*Meriones hurriance*. Further it was also observed that the addition of soybean oil, sugar and gur, individually decreases the consumption. Prakash et al (1969) also reported the decreased palatability due to additives against *Meriones hurriance* and *Tatera indica*.

It can be concluded from above findings that commonly available jowar or wheat flour mixed with 1% groundnut oil and 1% gur can be used as the readily acceptable poison carrier in the rodent control operation.

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