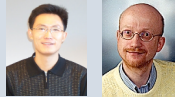


Rats show individual preference for short-term choice of three human diets



Chen Yong¹, Ulrich Halekoh², Henry Jørgensen¹, and Charlotte Lauridsen¹



¹Department of Animal Nutrition and Physiology and ²Department of Animal Breeding and Genetics, Danish Institute of Animal Science, Research Centre Foulum, P. O. Box 50, 8830 Tjele, Denmark



Introduction

Food preference tests represent a new approach in food quality research. A great number of investigations using laboratory rats concerning essential and/or dangerous contents are based on this method and have shown its effectiveness. The selection of food is influenced to some degree by smell and taste, but mostly by wholesomeness and need.

Objective

To test eventual selective differences among rats with regard to three iso-caloric human diets of same composition, but cultivated in three different systems.

Materials and methods

Rats and diets

Wistar male rats (n=27) weighing 80-120 g and being 55-60 days old, were kept individually in cages, and were arranged in a block design with three blocks of 9 rats. The diets were formulated to meet the NRC requirements for rats by mixing potatoes, carrots, peas, green kale, apple, and rapeseed oil. The foods were produced by three different cultivation strategies, i.e. organic (ORG), conventional (CON), or semi-organic (ORG+) farming system.

Management

The rats were kept at 22°C, 50%~60% relative humidity and a 12-h light/dark cycle. Rats had free access to food and water. Three feeders containing each of the three diets were placed in each cage. The reminders of the feeds were weighed daily and discarded to determine the feed consumptions. The sequences of the feeders were changed daily to avoid the effect of "position preference". Preferences expressed by daily food-intake were analyzed taking into account the correlations of the choices of a rat per experimental day, and over the course of the experiment.

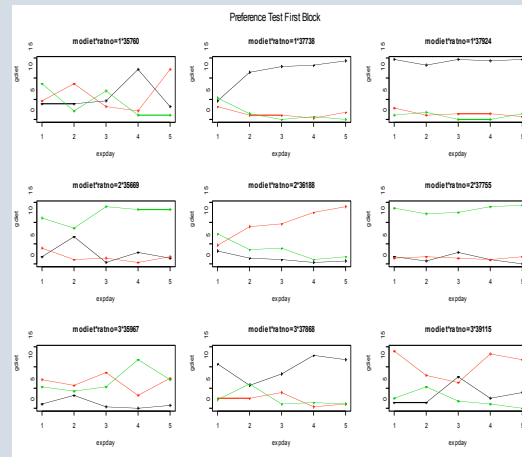


Figure 1 Example of individual plots of food intake. Black, red and green lines indicate food intakes of ORG, ORG+, and CON, respectively.

Table 1. The composition of the experimental diets (as fed basis)

Diets	ORG	ORG+	CON
Farming system	Organic	Organic	Conventional
Pesticide	-	+	+
Ingredients (g/kg)			
Potato	300.0	300.0	300.0
Carrot	50.0	50.0	50.0
Pea	472.4	472.4	472.4
Green kale	10.0	10.0	10.0
Apple	10.0	10.0	10.0
Rapeseed oil	130.0	130.0	130.0
DL-methionine	6.4	6.4	6.4
CaCO ₃	12.5	12.5	12.5
Salt	0.7	0.7	0.7
Premix	8.0	8.0	8.0
Composition			
Crude protein, %	16.03	16.06	16.09
GE, MJ/kg	21.04	21.24	21.32

Results

According to visual evaluation of the data it could be seen that:

- Seventeen rats had significant choice on the given foods
- Two, five, and ten rats preferred ORG, ORG+, CON, respectively
- Almost all individuals (except 2 rats) showed similar food choice in the two experimental periods
- Totally, rats indicated no preference among the three diets

Implication

The overall conclusion of the study is that rats show individual preference for the test diets, and that no clear difference among the dietary treatments could be obtained.

