DISSERTATION

NONLINEAR RESPONSES TO FOOD AVAILABILITY SHAPE EFFECTS OF HABITAT FRAGMENTATION ON CONSUMERS

Submitted by

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Graduate Degree Program in Ecology

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Spring 2009

COLORADO STATE UNIVERSITY

April 1, 2009

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY HEATHER B. BLACKBURN ENTITLED NONLINEAR RESPONSES TO FOOD AVAILABILITY SHAPE EFFECTS OF HABITAT FRAGMENTATION ON CONSUMERS BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

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ABSTRACT OF DISSERTATION

NONLINEAR RESPONSES TO FOOD AVAILABILITY SHAPE EFFECTS OF HABITAT FRAGMENTATION ON CONSUMERS

Fragmentation of landscapes is a pervasive source of environmental change. Although understanding the effects of fragmentation has occupied ecologists for decades, there remain important gaps in our understanding of the way that fragmentation influences populations of mobile organisms. In particular, there is little tested theory explaining the way that fragmentation shapes interactions between consumers and resources. I propose a simple model that explains why fragmentation may harm consumers even when the total amount of resources on the landscape remains unchanged. In the model, I show that nonlinearity in the relationship between resource availability and benefit acquired from resources can cause a decrease in benefits to consumers when landscapes are subdivided into isolated parts. This decrease is the result of simple mathematical properties of the form of the relationship between resource availability and benefit, and is more severe with greater nonlinearity, with increasing fragmentation, or with greater unevenness of resource availability between fragments. I tested the predictions of the model using a laboratory system of cabbage looper (*Trichoplusia ni*) larvae on artificial landscapes. Consistent with the model's predictions, survivorship of larvae decreased with a combination of fragmentation and heterogeneity in resource availability. However, average mass of surviving larvae did not change in response to fragmentation alone. With basic knowledge of consumer resource use patterns and landscape structure, these observations can aid in making both generalized and quantitative predictions about the resource-mediated effects of fragmentation on consumers.

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ACKNOWLEDGEMENTS

I would like to thank my wonderful husband for his love, help and limitless patience throughout this process. I would also like to thank my co-advisors, Jim Detling and Tom Hobbs, and my committee members, Ruth Hufbauer and Diana Wall. I appreciate Jim ZumBrunnen and Phil Chapman for all their help with the statistics. I am deeply grateful for all the help with current and past iterations of my research from friends, including Catherine and David Jarnevich, Joyce Acen, Danielle Bilyeu Johnston, Bonnie Robertson, Erica Monaco, Josh Carter, Adrienne Morgan, and many others.

Support for this work was provided by National Science Foundation Grants: (1) Effects of Habitat Fragmentation on Consumer Resource Dynamics in Environments Varying in Space and Time; Grant No. DEB-0444711 to Colorado State University, and (2) Biocomplexity, Spatial Scale, & Fragmentation: Implications for Arid & Semi-Arid Ecosystems ON CAM; Grant No. DEB-0119618 to Colorado State University.

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INTRODUCTION

Anthropogenic fragmentation is one of the dominant forces driving landscape and ecosystem changes worldwide. It is geographically widespread, ongoing in diverse landscapes undergoing agricultural, residential, or industrial development. In recent decades, a large body of research on fragmentation and its effects has developed (Fig. 1). Interest is particularly keen in the effects of fragmentation on consumers (Andren 1994, 1996, Dooley and Bowers 1998, Fahrig 1998, Bowers and Dooley 1999, Lampila et al. 2005).

Fragmentation in its many forms can be a major agent of change in communities and populations (Dunning et al. 1992, Bascompte and Sole 1996, Bender et al. 1998, Debinski and Holt 2000, Tischendorf et al. 2005, van Nouhuys 2005, Cushman 2006). Interactions between resources and consumers also play a vital role in structuring communities, determining demographic rates in populations, and affecting individual condition (Mountford 1988, Hunter and Price 1992, Krebs 1995, Blanckenhorn 1999, Turchin and Batzli 2001, Sinclair and Krebs 2002). Fragmentation can restrict the options available to consumers that occupy heterogeneous landscapes and, in so doing, may affect relationships between consumers and their food supplies.

Although there is abundant empirical work exploring the effects of fragmentation on consumers is abundant, predictive theory is sparse, particularly theory that identifies potentially critical relationships among fragmentation, resource distribution, and consumer responses. This lack is regrettable because well-crafted theory can "simplify our education by substituting one theory for many facts (Macarthur and Wilson 1967)." A tightly reasoned assemblage of a few theories, supported by experimental evidence, may be useful to clarify the conceptual picture of fragmentation when a large and varied set of observations threatens to become a confusing muddle. This condensation of observations into theory can create frameworks helpful in understanding and investigating processes occurring in real landscapes.

Jensen's inequality applied to fragmentation and resource distribution

The goal of this dissertation is to contribute to fragmentation theory and test the new concepts with a model system. To this end, I present an application of Jensen's inequality to fragmentation and resource distribution on landscapes. This approach differs in several respects from traditional concepts of fragmentation in preexisting literature. For example, it explores the effects of isolating areas of a landscape with respect to consumers, and does not require habitat loss or extensive rearrangement of habitat on the landscape. Much fragmentation research compares landscapes with large, contiguous patches of habitat to landscapes with smaller habitat patches (Andren 1994, Dooley and Bowers 1998, Gehring and Swihart 2003, Castellon and Sieving 2006). This frequently implies overall habitat loss (*e.g.*, Fig. 2). Several authors have pointed out the importance of distinguishing between the effects of patch isolation and overall habitat loss (Haila 1986, Andren 1996, Fahrig 1997, Andren 1999). Other studies use patch size as a surrogate for fragmentation level, and compare populations among patches of different size classes distributed throughout the same landscape (Dooley and Bowers 1998, Pineda and Halffter 2004, Michalski and Peres 2007) (*e.g.*, Fig. 3). When habitat loss is taken into account, these comparisons still tend to include both decreasing size and increasing isolation of habitat patches and the change of habitat characteristics; *i.e.*, an increase in the ratio of edge to core habitats (Niemela 2001). Because patch size reduction, patch isolation and change in habitat characteristics may occur to different degrees in different situations, distinguishing between the effects of these processes is also desirable, although often difficult in experimental practice.

The current approach also differs from most traditional fragmentation research in that it focuses on the limitation of consumer movement, allowing for complex arrangements of resources on the landscape. It is not dependent on the habitat:matrix paradigm inherent in much fragmentation research (Haila 2002) and inherited from adaptations of Macarthur and Wilson's theory of island biogeography (1967). Fragmentation research in the habitat:matrix tradition compares the effects of different arrangements and sizes of resource-containing patches on the landscape, surrounded by intervening spaces of cover types that may or may not inhibit the movement of consumers. This tradition has produced valuable theoretical progress, but necessarily simplifies landscapes into a manageable number of homogeneous patch types. As a result, it is most directly applicable to landscapes composed of well-defined, internally uniform fragments (Fig. 4). The framework presented here focuses on the inhibition of consumer movement to defined areas that may contain any combination of cover types (Fig. 5). It therefore takes into account the gradients of productivity possible in a complex landscape while isolating the effects of limiting consumer movement on the landscape.

Biology of the experimental organism

To test the modeled application of Jensen's inequality to fragmentation and resource heterogeneity, I used a set of artificial landscapes stocked in the laboratory with *Trichoplusia ni* (cabbage looper; Insecta: Lepidoptera: Noctuidae) larvae. *T. ni* is a native American agricultural pest found from Canada to Mexico. It overwinters in Mexico and the southernmost states of the United States, and reinvades more northerly latitudes annually. Adults are highly dispersive; flight ranges have been estimated at 200 km. They are considered seminocturnal because feeding and oviposition activity is greatest at dusk. Cultivated crucifers are the most common host plants, but *T. ni* also injures many other crop plants including beans, peas, squash and melons, and some cultivated flowers (Soo Hoo et al. 1984).

Multiple overlapping *T. ni* generations may be completed annually, depending on climate and location. Generation time is highly variable, responsive mostly to temperature. Life stage durations have been estimated in the laboratory at approximately 2-10 days as an egg (Jackson et al. 1969), 17-21 days as a larva, 4-13 days as a pupa, and 10-12 days as an adult (Shorey et al. 1962); however, extreme temperature conditions can produce shorter or longer generation times. Time from egg to adult can be as short as 18 days at 31°C (Toba et al. 1973).

Trichoplusia ni is commonly reared in the laboratory for research. Large numbers of *T. ni* at any life stage can be ordered from commercial laboratories, and artificial food formulated for *T. ni* is available. These conveniences simplify standardization of laboratory procedures. Cabbage loopers can be reared through the larval stage at high densities (*e.g.*, approximately 1 larva/3.6 cm^2, pilot studies, Blackburn 2005).

The model organism allowed for testing of the model concepts with large numbers of larvae in the laboratory. Experimental support for the effects of Jensen's inequality on consumers in fragmented landscapes bolsters the evidence that inhibition of consumer movement on the landscape can have effects independent of habitat loss. This empirically supported model therefore adds to the body of theory available for consideration in land use planning and development, and suggests a mechanistic basis for some previously observed responses to fragmentation in the field.

LITERATURE CITED

Andren, H. 1994. Effects of habitat fragmentation on birds and mammals in landscapes with different proportions of suitable habitat - a review. Oikos **71**:355-366.

Andren, H. 1996. Population responses to habitat fragmentation: Statistical power and the random sample hypothesis. Oikos **76**:235-242.

Andren, H. 1999. Habitat fragmentation, the random sample hypothesis and critical thresholds. Oikos **84**:306-308.

Bascompte, J., and R. V. Sole. 1996. Habitat fragmentation and extinction thresholds in spatially explicit models. Journal of Animal Ecology **65**:465-473.

Bender, D. J., T. A. Contreras, and L. Fahrig. 1998. Habitat loss and population decline: A meta-analysis of the patch size effect. Ecology **79**:517-533.

Blanckenhorn, W. U. 1999. Different growth responses to temperature and resource limitation in three fly species with similar life histories. Evolutionary Ecology **13**:395-409.

Bowers, M. A., and J. L. Dooley. 1999. A controlled, hierarchical study of habitat fragmentation: responses at the individual, patch, and landscape scale. Landscape Ecology **14**:381-389.

Cushman, S. A. 2006. Effects of habitat loss and fragmentation on amphibians: A review and prospectus. Biological Conservation **128**:231-240.

Debinski, D. M., and R. D. Holt. 2000. A survey and overview of habitat fragmentation experiments. Conservation Biology **14**:342-355.

Dooley, J. L., and M. A. Bowers. 1998. Demographic responses to habitat fragmentation: Experimental tests at the landscape and patch scale. Ecology **79**:969-980.

Dunning, J. B., B. J. Danielson, and H. R. Pulliam. 1992. Ecological processes that affect populations in complex landscapes. Oikos **65**:169-175.

Fahrig, L. 1997. Relative effects of habitat loss and fragmentation on population extinction. Journal of Wildlife Management **61**:603-610.

Fahrig, L. 1998. When does fragmentation of breeding habitat affect population survival? Ecological Modelling **105**:273-292.

Haila, Y. 1986. North European land birds in forest fragments: evidence for area effects? Pages 315-319 *in* J. Verner, M. L. Morrison, and C. J. Ralph, editors. Wildlife habitat 2000: modeling habitat relationships of terrestrial vertebrates. University of Wisconsin Press, Madison, Wisconsin.

Haila, Y. 2002. A conceptual genealogy of fragmentation research: From island biogeography to landscape ecology. Ecological Applications **12**:321-334.

Hunter, M. D., and P. W. Price. 1992. Playing Chutes and Ladders - Heterogeneity and the Relative Roles of Bottom-up and Top-Down Forces in Natural Communities. Ecology **73**:724-732.

Jackson, C. G., J. Butler, G.D., and D. E. Bryan. 1969. Time required for development of *Voria ruralis* and its host, the cabbage looper, at different temperatures. Journal of Economic Entomology **62**:69-70.

Krebs, C. J. 1995. 2 Paradigms of Population Regulation. Wildlife Research **22**:1-10.

Lampila, P., M. Monkkonen, and A. Desrochers. 2005. Demographic responses by birds to forest fragmentation. Conservation Biology **19**:1537-1546.

Macarthur, R. H., and E. O. Wilson. 1967. The theory of island biogeography. Princeton University Press, Princeton, New Jersey.

Mountford, M. D. 1988. Population Regulation, Density Dependence, and Heterogeneity. Journal of Animal Ecology **57**:845-858.

Niemela, J. 2001. Carabid beetles (Coleoptera: Carabidae) and habitat fragmentation: a review. European Journal of Entomology **98**:127-132.

Shorey, H. H., L. A. Andres, and R. L. Hale. 1962. The biology of *Trichoplusia ni* (Lepidoptera: Noctuidae). I. Life history and behavior. Annals of the Entomological Society of America **55**:591-597.

Sinclair, A. R. E., and C. J. Krebs. 2002. Complex numerical responses to top-down and bottom-up processes in vertebrate populations. Philosophical Transactions of the Royal Society of London Series B-Biological Sciences **357**:1221-1231.

Soo Hoo, C. R., D. L. Coudriet, and P. V. Vail. 1984. *Trichoplusia ni* (Lepidoptera: Noctuidae) larval development on wild and cultivated plants. Environmental Entomology **13**:843-846.

Tischendorf, L., A. Grez, T. Zaviezo, and L. Fahrig. 2005. Mechanisms affecting population density in fragmented habitat. Ecology and Society **10**.

Toba, H. H., A. N. Kishaba, R. Pangaldan, and P. V. Vail. 1973. Temperature and the development of the cabbage looper. Annals of the Entomological Society of America **66**:965-974.

Turchin, P., and G. O. Batzli. 2001. Availability of food and the population dynamics of arvicoline rodents. Ecology **82**:1521-1534.

van Nouhuys, S. 2005. Effects of habitat fragmentation at different trophic levels in insect communities. Annales Zoologici Fennici **42**:433-447.

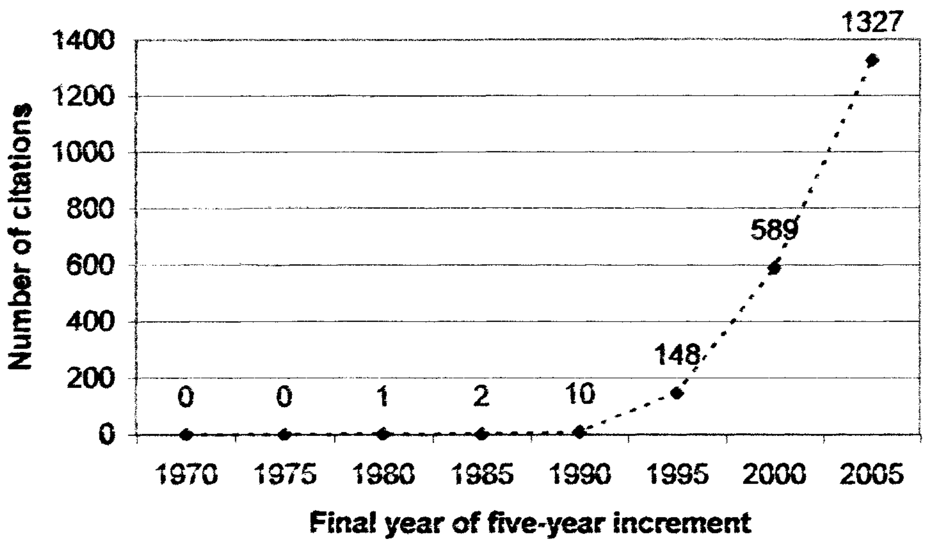


FIG. 1. Number of citations for habitat and landscape fragmentation papers in Web of Science over time. The search string was: 'ts="habitat fragmentation" or ts="landscape fragmentation".' The search was bounded in five-year increments. The total number of citations returned for the five-year period is reported in the figure; citation counts are not cumulative over time.

FIG. 2A

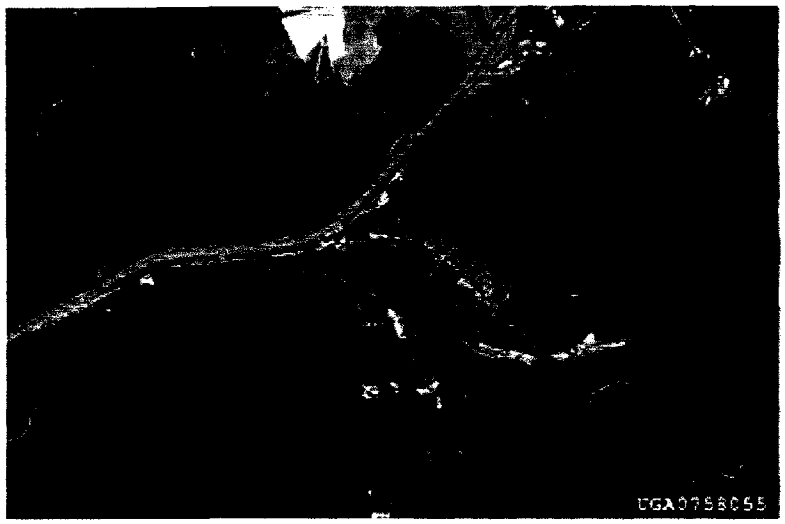
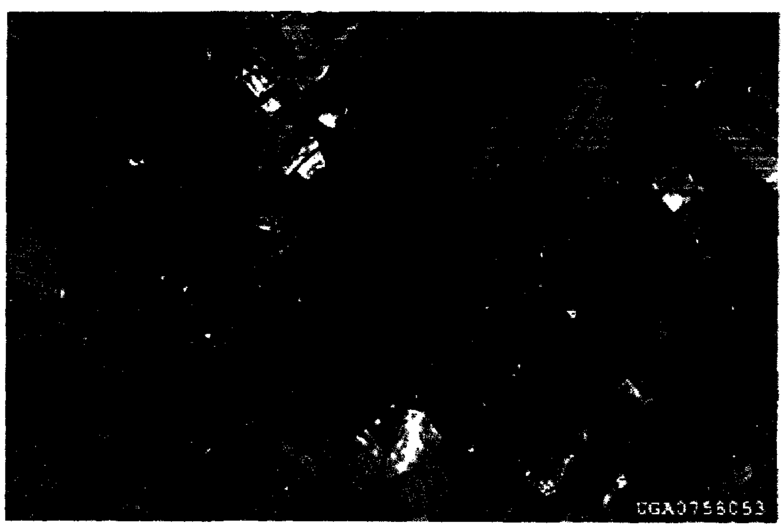


FIG. 2B



Both photos: William M. Ciesla, Forest Health Management International, Bugwood.org

FIG. 2. Comparison of a landscape with large contiguous forest fragments (A) to a landscape with small fragments (B). Forest is in red.

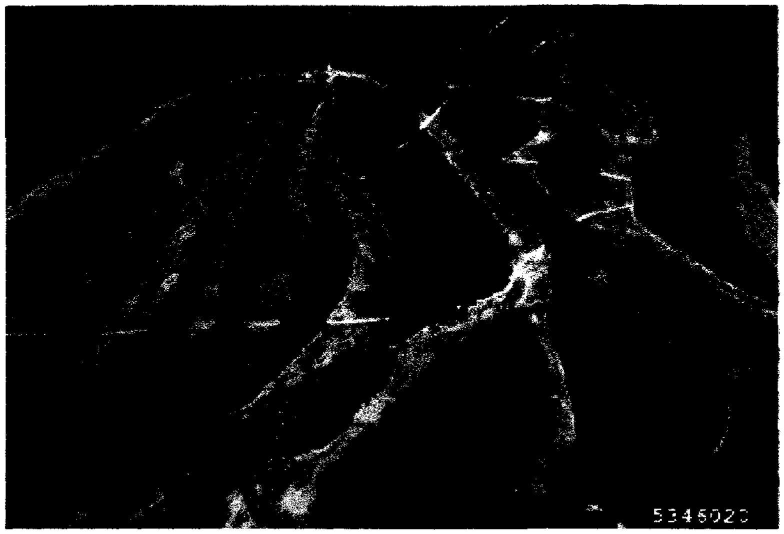


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FIG. 3. Landscape with forest fragments of various sizes. A hypothetical study using patch size as a surrogate for fragmentation level might observe consumer populations in each of the fragments and search for correlations between population characteristics and fragment size.

FIG. 4. Landscape composed of well-defined borders between homogeneous cover types. Photo by USDA Forest Service.

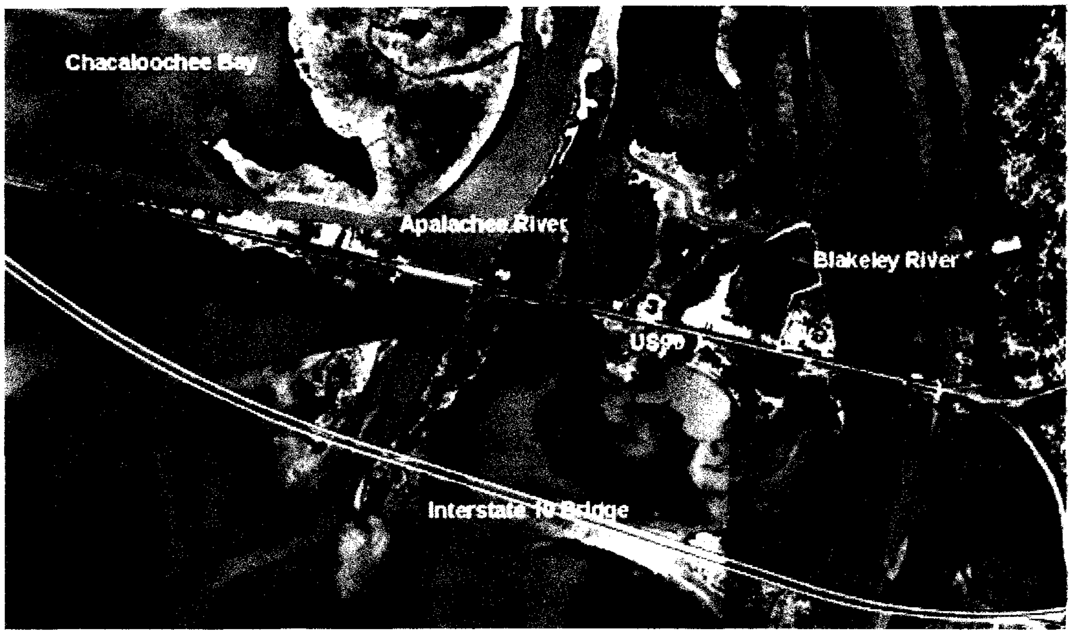

FIG. 5. Complex subdivided landscape. This area adjoining Chacaloochee Bay in Baldwin County, Alabama is an example of a landscape in which consumer movement may be restricted (by roads) into areas containing complex arrangements of resources. Photo by Matthew J. Aresco, used with permission.

NONLINEARITY IN CONSUMER RESPONSE TO FOOD AVAILABILITY: FRAGMENTATION AND RESOURCE HETEROGENEITY DECREASE CONSUMER SUCCESS

INTRODUCTION

Fragmentation, the dissection of landscapes into spatially isolated parts, is a major driver of environmental change worldwide (Fischer and Lindenmayer 2007). Landscape fragmentation refers to a reduction in connectivity between parts of a landscape (Zhu et al. 2006, Jaeger et al. 2007) or the conversion of the landscape into a mosaic of cover types, some of which differ from the original habitat (Southworth et al. 2004, Gonzalez-Abraham et al. 2007). The ecological implications of these changes remain largely unresolved (Bowman et al. 2002, McGarigal and Cushman 2002, Stephens et al. 2003, Ryall and Fahrig 2006).

This absence of consensus in studies of fragmentation results, at least in part, from ambiguity in terminology. Fragmentation may imply habitat loss, patch size reduction, increased patch number, increased isolation between segments of the landscape, increase in the length of edges between habitats, increased contrast between habitat and matrix, and habitat alteration or conversion (Wiens 1995, Jaeger 2000, Fahrig 2003, Southworth et al. 2004, Zhu et al. 2006, Gonzalez-Abraham et al. 2007). These changes are often confounded, as, for example, when patches of forest remain standing within land cleared for agriculture (Castellon and Sieving 2006). In this case, forest patches are simultaneously smaller and more widely separated than before trees were cleared, and a new type of habitat is created. However, there are also cases in which habitats are broken into isolated fragments without significant reductions in habitat area, such as when roads or fences limit movement of animals across landscapes (Forman and Alexander 1998, Serrano et al. 2002, Bhattacharya et al. 2003, Hawbaker et al. 2006, Jaeger et al. 2007).

Because fragmentation may occur with different degrees of overall habitat loss, it is important to distinguish between the effects of habitat loss and the effects of reduced landscape connectivity. Several researchers have urged limiting the use of the term "fragmentation" to mean the breaking apart of habitat, thereby making a clear distinction between fragmentation and habitat loss (Fahrig 1997, Andren 1999, Harrison and Bruna 1999, Ryall and Fahrig 2006). The importance of this distinction is evident in literature examining the effects of fragmentation on species richness. Harmful effects of fragmentation on biodiversity often result from habitat loss and not fragmentation *per se*. When studies have controlled for habitat loss, other components of fragmentation have shown more varied and generally weaker effects on biodiversity (Fahrig 2003, Ewers and Didham 2006).

Lack of consistency in the observed effects of fragmentation also reflects species specific differences in sensitivity to landscape change (Cushman 2006, Ewers and Didham 2006). For example, a landscape that is fragmented with respect to one species may not be functionally fragmented to another, more vagile species (van Nouhuys 2005, Wiegand et al. 2005) or to a habitat generalist (Andren 1994). Furthermore, fragmentation may increase the proportion of high-quality habitat for edge specialists and decrease it for core specialists (Bender et al. 1998, Bowers and Dooley 1999). The development of useful species-specific predictions of the effects of fragmentation therefore requires identification of the processes that may affect populations in fragmented landscapes and the conditions under which they are likely to be important (Debinski and Holt 2000, Cushman 2006, Ewers and Didham 2006).

Identifying general processes that mediate the effect of fragmentation on species depends upon the development of predictive theory. A large body of theory predicts the consequences of loss of connectivity among populations (Roff 1974, Wiens 1976, Cantrell and Cosner 1991, 2001, Tischendorf et al. 2005, Wiegand et al. 2005). However, at the level of the individual, theory of effects of fragmentation is less well developed.

Resource availability exerts strong control on the condition of individuals (Choquenot 1991, Scott and Fore 1995, Rheault and Rice 1996, Rinke and Petzoldt 2003, Dmitriew and Rowe 2005), which, in turn, shapes the dynamics of populations (Power 1992, Bayliss and Choquenot 2002, Sibly and Hone 2002, Sinclair and Krebs 2002). Therefore, interactions between individual consumers and resources play a central role in shaping the dynamics of populations and communities (Murdoch et al. 2003). Consumers are known to respond to spatial variability in resource availability at multiple scales (Senft et al. 1987, O'Neill et al. 1988, Searle et al. 2006) and it is plausible that one of the effects of fragmentation is to interfere with this response. However, theory linking fragmentation, spatial distribution of resources, and consumers is limited primarily to three efforts: 1) Derivations of Root's (1973) resource concentration hypothesis, which relied on differential immigration rates between food patches to predict a positive relationship between food patch area and consumer population density (Matter 1999a, Connor et al. 2000); 2) discussions of habitat complementarity, which postulates that access to multiple habitat types benefits certain species, and some patterns of fragmentation may enhance that access (Dunning et al. 1992, Fahrig 2003, Haynes et al. 2007); and 3) analyses of differential foraging patterns or detection mechanisms (Bukovinszky et al. 2005, Hamback and Englund 2005). These studies provide valuable insight into the effects of changing patterns of resource distribution on a landscape, but they define fragmentation as subdivision of habitat or resource patches; there are no barriers to consumer mobility that are independent of the arrangement of habitat patches. Therefore, they do not specifically address a core question regarding effects of fragmentation: How does restriction of movement affect the benefit gained from resources by consumers?

In this paper, I present a general model that portrays how fragmentation interacts with the spatial distribution of resources on the landscape to alter the benefit to consumers. The model specifically refers to average body mass of survivors and survivorship as measures of benefit to consumers, but can be expanded to apply to other measures of individual and population success. I then evaluate the predictions of the model experimentally by examining the effects of fragmentation and resource availability on survival and body mass of the cabbage loooper (*Trichoplusia ni*) in the laboratory.

A MODEL OF RESOURCE-MEDIATED EFFECTS OF FRAGMENTATION ON CONSUMERS

Consider a population of mobile consumers occupying a landscape of area = A. The landscape is dissected into z fragments such that consumers can move freely within fragments but cannot move among them. The area of each fragment is a_i. The landscape contains a quantity of resources specified as M that limits the growth of the consumer population. For the example here, I will consider these resources to be food, but they could be any limiting resource. The consumer population contains N individuals, with n_i individuals within each fragment, and an average density of N/A individuals on the landscape. The quantity of food contained within a given fragment i is m_i (i=1…z). Food, consumers, and area can be allocated evenly or unevenly among fragments.

Resource availability and average consumer benefit

I define a resource - benefit function, $b_i = f(v_i)$, that relates the benefits (b_i) provided by available resources (v_i) to the consumers in each fragment.

These benefits might, for example, include food capture rate, acquired fat reserves, body size, or some composite of these measures. Resource availability to consumers may be assessed as the quantity of resources per capita *(i.e,* $v_i = m_i/n_i$*)* or as resource density ($v_i = m_i/a_i$). If the rate of increase in benefits to consumers decelerates with increasing resource availability, as is commonly the case (Spalinger and Hobbs 1992, Stelzer 2001, Bayliss and Choquenot 2002, Polishchuk and Vijverberg 2005), then the benefit function will be monotonically increasing and asymptotic (Fig. 1). The asymptote represents the maximum benefits accrued by consumers when resources are unlimited.

I assume that the landscape can be subdivided into *z* fragments without altering the total quantities of resources or consumers on the landscape, and without decreasing total habitat area. The overall average resource availability (measured as food/consumer or food/area) on the landscape, therefore, is unchanged with fragmentation. However, the resulting average benefit to consumers in the fragmented environment (B') will be lower than the average benefit in the intact one (B (Fig. 1)).

The decrease in benefits to consumers on the fragmented landscape occurs as a result of Jensen's inequality (Jensen 1906), which states that the mean of the output of a convex-up, nonlinear function such as that shown in Figure 1 will always be less than the function of the mean of the inputs. This occurs as the result of the differences in the slope of the function above and below the point representing the average resource availability on the landscape. When resource availability / benefit functions are convex-up, the set of fragments with lower than average resource availability has a greater effect on the mean benefit than the set of fragments above the average resource availability. This causes a reduction in the mean benefit among fragments in the fragmented landscape relative to the unfragmented landscape when resource availability differs between fragments.

The decrease in average benefit to consumers when a landscape is subdivided tends to be more severe at high levels of fragmentation than at low levels. Essentially, the decline in benefit due to Jensen's inequality applies to each successive division of the landscape, so that when (for example) one of the fragments in a fragmented landscape is divided in half, increasing the total number of fragments, Jensen's inequality decreases the average benefit of the new pair of fragments relative to the original fragment. Therefore, the average benefit to consumers across the landscape decreases with progressive fragmentation.

Heterogeneity in resource availability exacerbates the effects of fragmentation

Jensen's inequality implies that increasing the disparity in values of the independent variable amplifies the effects of nonlinearity on the difference between the mean of the function and the function of the mean (Ruel and Ayres 1999, Pasztor et al. 2000, Benedetti-Cecchi 2005a, Inouye 2005). In this model system, this means that increasing differences in resource availability between fragments amplifies the negative effect of fragmentation on the average benefit accrued by consumers (Fig. 2). To illustrate this effect, I randomly generated resource availability values for eight fragments in each of 100 hypothetical landscapes, with the resource availability on each landscape averaging 40 units (food/area or food/consumer). Using a Michaelis-Menten equation $b_i = 50v_i/(30+v_i)$, I calculated the benefit (b_i) to consumers in each fragment and plotted the average benefit against the spatial variance in resource availability among fragments for each landscape (Fig. 3). When all fragments have identical resource availability (*i.e.,* resource and consumers are distributed in a matched manner, $\sigma^2_{m_i/n_i}=0$, or resource densities are equal among fragments, $\sigma^2_{m_i/a_i}=0$), the mean benefit on the landscape is not altered by fragmentation.

Recall that the decrease in average benefit with increase in resource variance becomes more pronounced as landscapes become more highly fragmented. Therefore, fragmentation and resource heterogeneity jointly decrease average and total per capita benefit derived from resources in a landscape.

A mechanism for effects of fragmentation on consumers

The theory developed above predicts that fragmentation will harm the population of consumers on the landscape whenever the per capita availability of resources is heterogeneous over space—that is, when the resources available to consumers differ among fragments. This suggests that some of the harmful effects of fragmentation on consumers are a result of preventing animals from matching their spatial distribution to the distribution of resources. If the spatial distribution of consumers is proportional to the spatial distribution of resources, all consumers experience the same average supply of resources; I will refer to this situation as a matched distribution. Graphically, this means that the per capita resource availabilities for all consumers occupy a single point on the benefit function. Therefore, I predict that when animals and resources are distributed in a matched manner among newly created fragments, fragmentation will not affect their performance because there is no heterogeneity in availability of resources per individual.

Model Predictions

The theory developed above motivates three testable predictions:

1) When landscapes are intact, that is, when there are no barriers to consumer movement, spatial heterogeneity in resources will not affect the benefits that consumers acquire from resources.

2) Consumers in fragmented landscapes will show reduced benefits from resources relative to consumers in intact or less fragmented landscapes when two conditions hold:

   a) There is a convex-up relationship between acquired benefits and per-capita resource availability.

   b) Per capita resource availability is not equal among fragments (*i.e.*, resources and consumers are unmatched).

increasing the number of barriers to movement within a landscape amplifies the reduction in benefits to consumers caused by fragmentation if newly created fragments have unequal per capita resource availabilities.

3) In fragmented landscapes, consumers will show lower benefits from resources when per capita resource availability is variable among fragments (*i.e.*, an unmatched distribution) than when resource availability is consistent (*i.e.*, a matched distribution).

MATERIALS AND METHODS

Experimental design

To test these predictions, I conducted two experiments. In Experiment 1, I held the spatial distribution of consumers constant (homogeneous) and varied the levels of spatial heterogeneity in food (homogeneous vs. heterogeneous) and the levels of fragmentation (none, low, high). In Experiment 2, I held the spatial distribution of consumers constant (heterogeneous) and varied the levels of spatial heterogeneity in food (homogeneous vs. heterogeneous) and the levels of fragmentation (none, low, high). The ratios of heterogeneous consumer distributions and heterogeneous food distributions across quarters of the landscapes were both approximately 1:2:3:5. Therefore, in Experiment 1, the matched treatment was homogeneous food and homogeneous consumers; in Experiment 2, the matched treatment was heterogeneous food and heterogeneous consumers. Both experiments were implemented as randomized complete blocks with five temporal replications. Prediction 1 can be tested by examining the effect of spatial heterogeneity in resources and consumers when landscapes are intact. Prediction 2 can be tested by comparing the fragmented vs. the unfragmented treatments when consumer-resource distributions are matched and when they are not and when resource benefit functions are linear vs. convex-up. Prediction 3 can be tested by examining differences between matched treatments and unmatched treatments in the fragmented landscapes.

Experimental procedure

The cabbage looper, *Trichoplusia ni* (Lepidoptera: Noctuidae), has been widely used as a model organism because it is easy to raise in large numbers in laboratory and because of its importance as an agricultural pest (McEwen and Hervey 1960, Fuxa et al. 1998). *T. ni* does not undergo diapause and cannot tolerate prolonged cold weather; it is highly dispersive, and reinvades much of the northern United States and Canada annually after overwintering in southern latitudes. Larvae feed on the leaves of a wide range of cultivated plants, particularly crucifers and cotton (Soo Hoo et al. 1984). Cabbage looper larvae can be reared at high densities on artificial diet and reach pupation at two to over six weeks from hatch (McEwen and Hervey

1960, Blackburn 2009 pilot study). The rate of development is largely dependent on temperature (Shorey et al. 1962, Toba et al. 1973).

I obtained *T. ni* eggs before each replication of the two experiments (Benzon Research, Carlisle, PA) and portioned them onto artificial diet substrate (Southland Products Inc., Lake Village, AR) in covered 236.6 ml squat Styrofoam cups (30 eggs/cup). Eggs for each run were laid on the day before receipt and hatched from 48 to 96 hours after receipt. Individuals hatched in the cups and fed on the substrate until 7 days from hatch, when they were distributed on artificial landscapes. Approximately 80% of larvae measured 1.2 cm at the time of distribution.

I constructed artificial landscapes to implement the experimental design (Fig. 4). These landscapes were square, uncovered acrylic boxes (40.64 cm x 40.64 cm, 10.16 cm in height). The construction of the landscapes imposed the three levels of fragmentation using internal barriers. Barriers were absent in the no fragmentation treatment level. I divided the landscape into 4 fragments of equal size for the low fragmentation level and into sixteen fragments of equal size for the high fragmentation level. Heated barriers topping all internal subdivisions and the inside of the external wall were used to contain larvae within fragments (McEwen and Hervey (1960). Heated barriers consisted of nickel chromium wire covered in thermally conductive, electrically insulating epoxy. When electrical current was applied to the wire through a rheostat at 65 V, the epoxy was warm enough to prevent the larvae from crossing but caused no apparent injury to the larvae testing the barrier. Pilot studies indicated that temperature inside the landscapes was fairly consistent across treatments (within 2°C). Humidity in the room was kept above 60%.

I filled polyethylene tubing with artificial diet; when the diet cooled, the tubing was cut into uniform lengths (2.54 cm contained 0.930g of food, σ^2=0.013) and distributed in the landscapes over damp paper towels. In all landscapes, there were a total of 400 introduced *T. ni* larvae and 44 units of food (1 unit = 0.930 g). Two precut lengths of food equaled one unit.

To achieve a heterogeneous distribution of food, I distributed 4, 8, 12, and 20 units of food (sum = 44) among 4 quarters of the landscape (Fig. 5). Homogeneous distributions were achieved by allocating 11 units of food for each quarter. To achieve a heterogeneous distribution of consumers, I distributed 36, 72, 108, and 184 consumers in each quarter of a landscape; homogeneous consumer distributions had 100 individuals in each quarter. Food and consumers were distributed evenly within each quarter of a landscape at all fragmentation levels. Therefore, the high fragmentation treatments (in which the landscapes were divided into sixteenths) had four sixteenths of each level of food availability. For example, one quarter of the landscapes with heterogeneous food and heterogeneous consumers held four units of food and 36 consumers; the corresponding quarter of the high-fragmentation landscape consisted of four fragments, each with one unit of food and nine consumers.

Food was present in the landscapes when the larvae were introduced, and reapplied 48 hours and 76 hours after larval introduction. Twenty-four hours after the last food addition, I collected, weighed, and counted surviving larvae. The average wet mass of survivors and the proportion of survivors served as the two response variables. Both experiments were repeated five times for a total of ten runs.

Analysis

To estimate the shape of the relationship between consumer benefits and resource availability, I used data from the fragmented treatments of experiments 1 and 2, each of which provided four different levels of per-capita resource availability (0.04, 0.08, 0.12, and 0.2 units of food per consumer in Experiment 1; 0.06, 0.10, 0.15, 0.31 units of food per consumer in Experiment 2). I fit a quadratic model to the resource-benefit curves to test for convexity; if the quadratic term was significant, the form of the function was convex.

To test Prediction 1, I compared matched treatments with unmatched treatments at the zero fragmentation level. Prediction 1 would be upheld if no differences were detected between the treatments (Fig. 6).

To test Prediction 2, I compared the levels of fragmentation within unmatched treatments and matched treatments. Prediction 2 would be upheld in the unmatched treatments if benefit in the no fragmentation treatment was higher than in both the low and high fragmentation treatments, and if there was no difference between benefit in the low and high fragmentation treatments. In the matched treatments, Prediction 2 would be upheld if there was no difference in benefit among the three fragmentation levels (Fig. 6).

To test Prediction 3, I compared matched treatments with unmatched treatments at the low and high fragmentation levels. Prediction 3 would be upheld if benefit to consumers (average mass or survival) was higher in matched treatments than in the unmatched treatments (Fig. 6).

Comparisons were made in SAS using proc GLIMMIX for survivorship data and proc GLM for the average mass of survivors. Differences among temporal replications of the experiments necessitated comparisons within runs (using replicate number as an indicator variable) rather than pooling data across runs. All analyses were done using SAS version 9.1.

RESULTS

I observed convex-up relationships between food availability and survival in both experiments ($P < .007$, Fig. 7a) I also observed a convex-up relationship between food availability and average mass in Experiment 1 when consumers were homogenously distributed across heterogeneous food ($P < 0.0001$, Fig. 7b), but not in Experiment 2 when consumers were heterogeneously distributed across homogeneous food ($P > 0.05$, Fig. 7b).

Observations of survivorship supported most of the predictions of the model (Figs. 8a, 8b). I observed no effect of resource or consumer distribution in the absence of fragmentation (Prediction 1). Survival was lower in unmatched treatments than in matched treatments in fragmented landscapes, supporting Prediction 2 (Experiment 1 high fragmentation treatment, Experiment 2 high and low fragmentation; $P<0.0075$). However, this trend was not significant in the low fragmentation treatment of Experiment 1 ($P>0.05$). In both Experiment 1 (homogeneous distribution of consumers, heterogeneous and homogenous distribution of food) and Experiment 2 (heterogeneous distribution of consumers, heterogeneous and homogenous food), I observed fragmentation effects only in the unmatched treatment. In both experiments, when per capita resource availability was unmatched, I observed a decrease in survivorship from the unfragmented treatments to the fragmented treatments ($P<0.0079$), but did not observe differences between levels of fragmentation (low vs. high, $P > 0.05$)), supporting Prediction 3. Fragmentation did not influence survival when consumer-resource distribution was matched (Prediction 3, $P>0.05$).

Observations of average survivor mass were only partially consistent with model predictions (Figs. 8c, 8d). Consistent with Prediction 1, I observed no effect of consumer-resource distribution in the absence of fragmentation ($P>0.05$). Consistent with Prediction 2, I observed no effect of fragmentation when the resource-benefit function was not convex-up in Experiment 2 ($P>0.05$). However, I also observed no effect of fragmentation when the resource-benefit function was convex-up in Experiment 1, inconsistent with Prediction 2. Consistent with Prediction 3, I showed no effect of fragmentation when resource-benefit functions were not convex-up in Experiment 2. However, I also failed to show predicted effects of matched and unmatched consumer-resource distribution in fragmented landscapes when resource-benefit functions were convex-up, which does not support Prediction 3.

DISCUSSION

I develop new theory to explain how fragmentation affects interactions between individual consumers and resources, exploiting a simple observation—when resource-benefit functions are nonlinear and convex-up, dividing heterogeneous resources among fragments will diminish the average benefit to consumers relative to the case when landscapes are intact. The mechanism mediating harmful effects of fragmentation on consumers is simple: in fragmented environments, individuals are unable to match their distribution to the distribution of resources on the landscape. Thus, my model predicts that the effects of fragmentation on consumers depend in a truly fundamental way on the spatial distribution of consumers and resources, and the shape of the relationship that governs the benefits that accrue from exploiting those resources.

Empirical observations were largely consistent with the predictions of the model. Fragmentation diminished consumer survival, but only when the distribution of consumers was not matched to the distribution of resources within fragments. I failed to observe any effect of fragmentation on mean body mass of surviving individuals. There are two potential reasons for this failure. First, response of body mass to food availability was not strongly non-linear. I observed only weak nonlinearity in Experiment 1 and did not observe significant nonlinearity in Experiment 2. Thus, the model did not predict strong effects of fragmentation on body mass, and variance in the average mass data was high. Any weak effects may have been masked by the high variance. Second, there may have been a confounding effect of the survival response on the body mass response. Reduced survival of individuals in the moderate and high fragmentation treatments likely increased the per-capita availability of resources in those treatments, diminishing the potential effect of fragmentation on mass.

Consistent with the predictions of the model, fragmentation did not affect consumers when resource-benefit functions were not strongly non-linear. The observation of different forms of the benefit:food function for different types of consumer responses is not unique. Arrivillaga and Barrera (2004) found a convex-up effect of food availability on survival and resistance to starvation in a mosquito, but a linear effect on per capita mass of survivors. Similarly, Atlantic puffins showed a linear response of body mass to food availability and a curvilinear response of several other measures of growth (Oyan and Anker-Nilssen 1996).

Negative effects of fragmentation on consumers within a heterogeneous landscape do not imply that spatial heterogeneity in resources is bad for consumers. Indeed, spatial heterogeneity has often been shown to be beneficial for consumer populations (Senft et al. 1987, Mysterud et al. 2001, Choquenot and Ruscoe 2003, Said and Servanty 2005, Wang et al. 2006). Rather, it is the loss of access to spatially heterogeneous resources that negatively impacts populations. Although several workers have hypothesized such impacts (Mysterud et al. 2001, Boone and Hobbs 2004, Fryxell et al. 2005) and recent observational studies provide empirical evidence supporting them (Hebblewhite et al. 2008), I provide the first experimental evidence for loss of consumer condition in response to fragmentation in heterogeneous environments. Fragmentation appears to affect consumer success by preventing consumers from matching their spatial distribution to the spatial distribution of resources. This mechanism is consistent with the diversity of observations of effects of fragmentation in field studies (Bender et al. 1998, Matter 1999b, Connor et al. 2000, Niemela 2001, Bowman et al. 2002, Matter 2007) because, by this mechanism, we expect fragmentation to harm consumers only when two conditions are met: a nonlinear response to resource availability and unequal resource availabilities among fragments. Thus, it is plausible that there will be circumstances when these conditions are met and when they are not, leading to conflicting observations on fragmentation effects. In addition, many existing studies of fragmentation correlate fragment size with consumer success (Bender et al. 1998, Connor et al. 2000). If consumer success is investigated relative to individual fragment area and resource distribution among fragments is not roughly proportional to fragment size, landscape-scale effects of fragmentation may not be observed even when they are present.

Extensions to Population Growth

I have outlined the effects of fragmentation and resource distribution on the benefit to individual consumers. However, the time scale of the experiments did not allow consumer populations to grow in response to resources or to allow feedbacks from consumers to modify resource production. If time scales were expanded, theory would predict (Fretwell and Lucas 1970, Schwinning and Rosenzweig 1990) that reduced survival of consumers in fragmented habitats could retard consumer population growth and, over time, allow populations to come into equilibrium with resources, achieving a matched distribution and eliminating the effects of fragmentation. This presumes that resources are sufficiently stable over time to allow populations to equilibrate with resources, and that there is a mutually effective density-dependent feedback between resource density and consumer population size. That is, if we define B' as population density within a fragmented landscape, nonlinearity in the function $b_i = f(v_i)$ will cause a decrease in B' only when differences in v_i are maintained among fragments, either by persistent spatial heterogeneity in resource distribution or by temporal shifts in resource quantity not directly caused by consumer densities. If V' is determined by per capita resource quantity and consumer and resource populations can equalize among fragments, nonlinearity in the function will not necessarily result in a decrease in population sizes.

Davis *et al.* (2002) recognized the significance of Jensen's inequality for numerical responses and consumer population sizes. They modified a model first developed by Pech and Hood (1998) to describe interactions between rainfall, pasture, rabbits, and foxes. Consistent with Jensen's inequality, a convex-up numerical response decreased long-term population growth rates when variance in the independent variable was high. They found that temporal variability in the rabbits' primary food resource negatively impacted the modeled rabbit density when the numerical response of rabbits to pasture biomass was convex-up and predators were absent. When foxes were included, variability in pasture biomass decreased the mean fox density, while the mean rabbit density increased as population fluctuations provided intermittent relief from fox predation. Spatial variance in resources can be considered analogous to temporal variance in resources as discussed by Davis *et al.* (2002); increasing variance of food availability decreases long-term average population growth rates or population densities.

Applicability to real systems

The basic assumption of convex-up nonlinearity in the relationship between consumer benefit and resources is likely to be met in many real systems (Choquenot 1998, Reinsel et al. 2001, Bayliss and Choquenot 2002, Rinke and Petzoldt 2003, Arrivillaga and Barrera 2004). Therefore, the interaction of patterns of resource distribution and patterns of subdivision should be of interest for conservation.

Previously observed results of fragmentation in one landscape may not be applicable to another landscape with different resource distribution patterns. For example, Boone *et al.* (2005) found that simulated patterns of livestock carrying capacity in Kaijado District, Kenya differed among ranches, dependent upon interactions among the degree of fragmentation, overall vegetation productivity, and resource heterogeneity. In general, the model developed in this paper demonstrates that the fragmentation of landscapes that are patchy at the scale of fragmentation is likely to have more negative effects on populations than the fragmentation of more homogeneous landscapes. This knowledge should inform land use decisions.

The generality of this model is complemented by its capacity to make quantitative predictions regarding the species and system of interest. If the resource-benefit function for a given consumer and resource can be estimated, the decrease in benefit due to Jensen's inequality can be derived for various fragmentation regimes and spatial patterns of resources. When subdivision of the landscape is being considered, if the potential decrease in benefit to consumers is deemed excessive based on consumer responses to food availability, land use patterns may be engineered to minimize the negative effects of fragmentation and resource heterogeneity on one or more focal species. The model suggests at least two methods of mitigation to minimize losses of average consumer benefit across the landscape: minimization of fragmentation and the equalization of resource availability among fragments.

This model can also be expanded to make site-specific predictions in systems with more complex resource-benefit functions. For example, sigmoidal functions contain a convex-up and a convex-down range of values; Jensen's inequality will decrease average benefit in fragmented, heterogeneous landscapes over the convex-up range and increase average benefit with fragmentation over the convex-down range. In another case, if benefit increases in a linear fashion with resource availability, but reaches a maximum value, the nonlinearity will only decrease benefit if the values of resource availability within fragments span the inflection point. This leads to the counterintuitive observation that, in this circumstance, fragmentation may have no effect on benefit at high or low food availabilities, but will decrease benefit when food availability is intermediate.

Nonlinearity in experimental practice and data interpretation

Temporally and spatially nonlinear relationships abound in natural systems. However, nonlinearity in key relationships and the possible role of Jensen's inequality in ecological processes have not been widely considered. Exceptions include the effects of spatial variance of biodiversity on average plant productivity (Benedetti-Cecchi 2005b) and the effects of environmental variation on optimal life history strategy (Pasztor et al. 2000). Ruel and Ayres (1999) cited several examples of the implications of Jensen's inequality for processes in physiological ecology, such as the effects of variability in environmental conditions on metabolic processes. Here, I show that nonlinearity in the relationship between resource availability and benefit to consumers has fundamental implications for the effects of landscape fragmentation on consumers.

LITERATURE CITED

Andren, H. 1994. Effects of habitat fragmentation on birds and mammals in landscapes with different proportions of suitable habitat - a review. Oikos **71**:355-366.

Andren, H. 1996. Population responses to habitat fragmentation: Statistical power and the random sample hypothesis. Oikos **76**:235-242.

Andren, H. 1999. Habitat fragmentation, the random sample hypothesis and critical thresholds. Oikos **84**:306-308.

Arrivillaga, J., and R. Barrera. 2004. Food as a limiting factor for *Aedes aegypti* in water-storage containers. Journal of Vector Ecology **29**:11-20.

Bascompte, J., and R. V. Sole. 1996. Habitat fragmentation and extinction thresholds in spatially explicit models. Journal of Animal Ecology **65**:465-473.

Bayliss, P., and D. Choquenot. 2002. The numerical response: rate of increase and food limitation in herbivores and predators. Philosophical Transactions of the Royal Society of London Series B-Biological Sciences **357**:1233-1248.

Bender, D. J., T. A. Contreras, and L. Fahrig. 1998. Habitat loss and population decline: A meta-analysis of the patch size effect. Ecology **79**:517-533.

Benedetti-Cecchi, L. 2005a. The importance of the variance around the mean effect size of ecological processes: Reply. Ecology **86**:265-268.

Benedetti-Cecchi, L. 2005b. Unanticipated impacts of spatial variance of biodiversity on plant productivity. Ecology Letters **8**:791-799.

Bhattacharya, M., R. B. Primack, and J. Gerwein. 2003. Are roads and railroads barriers to bumblebee movement in a temperate suburban conservation area? Biological Conservation **109**:37-45.

Blanckenhorn, W. U. 1999. Different growth responses to temperature and resource limitation in three fly species with similar life histories. Evolutionary Ecology **13**:395-409.

Boone, R. B., S. B. BurnSilver, P. K. Thornton, J. S. Worden, and K. A. Galvin. 2005. Quantifying declines in llivestock due to land subdivision. Rangeland Ecology and Management **58**:523-532.

Boone, R. B., and N. T. Hobbs. 2004. Lines around fragments: effects of fencing on large herbivores. African Journal of Range & Forage Science **21**:147-158.

Bowers, M. A., and J. L. Dooley. 1999. A controlled, hierarchical study of habitat fragmentation: responses at the individual, patch, and landscape scale. Landscape Ecology **14**:381-389.

Bowman, J., N. Cappuccino, and L. Fahrig. 2002. Patch size and population density: the effect of immigration behavior. Conservation Ecology **6**.

Bukovinszky, T., R. P. J. Potting, Y. Clough, J. C. van Lenteren, and L. E. M. Vet. 2005. The role of pre- and post-alighting detection mechanisms in the responses to patch size by specialist herbivores. Oikos **109**:435-446.

Cantrell, R. S., and C. Cosner. 1991. The effects of spatial heterogeneity in population-dynamics. Journal of Mathematical Biology **29**:315-338.

Cantrell, R. S., and C. Cosner. 2001. Spatial heterogeneity and critical patch size: Area effects via diffusion in closed environments. Journal of Theoretical Biology **209**:161-171.

Castellon, T. D., and K. E. Sieving. 2006. Landscape history, fragmentation, and patch occupancy: Models for a forest bird with limited dispersal. Ecological Applications **16**:2223-2234.

Choquenot, D. 1991. Density-dependent growth, body condition, and demography in feral donkeys - Testing the food hypothesis. Ecology **72**:805-813.

Choquenot, D. 1998. Testing the relative influence of intrinsic and extrinsic variation in food availability on fetal pig populations in Australia's rangelands. Journal of Animal Ecology **67**:887-907.

Choquenot, D., and W. A. Ruscoe. 2003. Landscape complementation and food limitation of large herbivores: habitat-related constraints on the foraging efficiency of wild pigs. Journal of Animal Ecology **72**:14-26.

Connor, E. F., A. C. Courtney, and J. M. Yoder. 2000. Individuals-area relationships: The relationship between animal population density and area. Ecology **81**:734-748.

Cushman, S. A. 2006. Effects of habitat loss and fragmentation on amphibians: A review and prospectus. Biological Conservation **128**:231-240.

Davis, S. A., R. P. Pech, and E. A. Catchpole. 2002. Populations in variable environments: the effect of variability in a species' primary resource. Philosophical Transactions of the Royal Society of London Series B-Biological Sciences **357**:1249-1257.

Debinski, D. M., and R. D. Holt. 2000. A survey and overview of habitat fragmentation experiments. Conservation Biology **14**:342-355.

Dmitriew, C., and L. Rowe. 2005. Resource limitation, predation risk and compensatory growth in a damselfly. Oecologia **142**:150-154.

Dooley, J. L., and M. A. Bowers. 1998. Demographic responses to habitat fragmentation: Experimental tests at the landscape and patch scale. Ecology **79**:969-980.

Dunning, J. B., B. J. Danielson, and H. R. Pulliam. 1992. Ecological processes that affect populations in complex landscapes. Oikos **65**:169-175.

Ewers, R. M., and R. K. Didham. 2006. Confounding factors in the detection of species responses to habitat fragmentation. Biological Reviews **81**:117-142.

Fahrig, L. 1997. Relative effects of habitat loss and fragmentation on population extinction. Journal of Wildlife Management **61**:603-610.

Fahrig, L. 1998. When does fragmentation of breeding habitat affect population survival? Ecological Modelling **105**:273-292.

Fahrig, L. 2003. Effects of habitat fragmentation on biodiversity. Annual Review of Ecology Evolution and Systematics **34**:487-515.

Fischer, J., and D. B. Lindenmayer. 2007. Landscape modification and habitat fragmentation: a synthesis. Global Ecology and Biogeography **16**:265-280.

Forman, R. T. T., and L. E. Alexander. 1998. Roads and their major ecological effects. Annual Review of Ecology and Systematics **29**:207-231.

Fretwell, S. D., and H. L. Lucas, Jr. 1970. On territorial behavior and other factors influencing habitat distribution in birds. I. Theoretical development. Acta Biotheoretica **19**:16-36.

Fryxell, J. M., J. F. Wilmshurst, A. R. E. Sinclair, D. T. Haydon, R. D. Holt, and P. A. Abrams. 2005. Landscape scale, heterogeneity, and the viability of Serengeti grazers. Ecology Letters **8**:328-335.

Fuxa, J. R., J.-Z. Sun, E. H. Weidner, and L. R. LaMotte. 1998. Stressors and rearing diseases of *Trichoplusia ni*: Evidence of vertical transmission of NPV and CPV. Journal of Invertebrate Pathology **74**:149-155.

Gehring, T. M., and R. K. Swihart. 2003. Body size, niche breadth, and ecologically scaled responses to habitat fragmentation: mammalian predators in an agricultural landscape. Biological Conservation **109**:283-295.

Gonzalez-Abraham, C. E., V. C. Radeloff, R. B. Hammer, T. J. Hawbaker, S. I. Stewart, and M. K. Clayton. 2007. Building patterns and landscape fragmentation in northern Wisconsin, USA. Landscape Ecology **22**:217-230.

Haila, Y. 1986. North European land birds in forest fragments: evidence for area effects? Pages 315-319 *in* J. Verner, M. L. Morrison, and C. J. Ralph, editors. Wildlife habitat 2000: modeling habitat relationships of terrestrial vertebrates. University of Wisconsin Press, Madison, Wisconsin.

Haila, Y. 2002. A conceptual genealogy of fragmentation research: From island biogeography to landscape ecology. Ecological Applications **12**:321-334.

Hamback, P. A., and G. Englund. 2005. Patch area, population density and the scaling of migration rates: the resource concentration hypothesis revisited. Ecology Letters **8**:1057-1065.

Harrison, S., and E. Bruna. 1999. Habitat fragmentation and large-scale conservation: what do we know for sure? Ecography **22**:225-232.

Hawbaker, T. J., V. C. Radeloff, M. K. Clayton, R. B. Hammer, and C. E. Gonzalez-Abraham. 2006. Road development, housing growth, and landscape fragmentation in northern Wisconsin: 1937-1999. Ecological Applications **16**:1222-1237.

Haynes, K. J., T. Diekotter, and T. O. Crist. 2007. Resource complementation and the response of an insect herbivore to habitat area and fragmentation. Oecologia **153**:511-520.

Hebblewhite, M., E. Merrill, and G. McDermid. 2008. A multi-scale test of the forage maturation hypothesis in a partially migratory ungulate population. Ecological Monographs **78**:141-166.

Hunter, M. D., and P. W. Price. 1992. Playing Chutes and Ladders - Heterogeneity and the Relative Roles of Bottom-up and Top-Down Forces in Natural Communities. Ecology **73**:724-732.

Inouye, B. D. 2005. The importance of the variance around the mean effect size of ecological processes: Comment. Ecology **86**:262-265.

Jackson, C. G., J. Butler, G.D., and D. E. Bryan. 1969. Time required for development of *Voria ruralis* and its host, the cabbage looper, at different temperatures. Journal of Economic Entomology **62**:69-70.

Jaeger, J. A. G. 2000. Landscape division, splitting index, and effective mesh size: new measures of landscape fragmentation. Landscape Ecology **15**:115-130.

Jaeger, J. A. G., H. Raumer, H. Esswein, M. Muller, and M. Schmidt-Luttman. 2007. Time series of landscape fragmentation caused by transportation infrastructure and urban development: a case study from Baden-Wurttemberg, Germany. Ecology and Society **12**.

Jensen, J. L. W. V. 1906. Sur les fonctions convexes et les inegalites entre les valeurs moyennes. Acta Mathematica **30**:175-193.

Krebs, C. J. 1995. 2 Paradigms of Population Regulation. Wildlife Research **22**:1-10.

Lampila, P., M. Monkkonen, and A. Desrochers. 2005. Demographic responses by birds to forest fragmentation. Conservation Biology **19**:1537-1546.

Macarthur, R. H., and E. O. Wilson. 1967. The theory of island biogeography. Princeton University Press, Princeton, New Jersey.

Matter, S. F. 1999a. Population density and area: the role of within- and between-generation processes over time. Ecological Modelling **118**:261-275.

Matter, S. F. 1999b. Population density and area: the role of within- and between-generation processes over time. Ecological Modelling **118**:261-275.

Matter, S. F. 2007. Population density and patch size: A field study of within and between generation variability. American Midland Naturalist **157**:1-10.

McEwen, F. L., and G. E. R. Hervey. 1960. Mass-rearing the cabbage looper, *Trichoplusia ni*, with notes on its biology in the laboratory. Annals of the Entomological Society of America **53**:229-234.

McGarigal, K., and S. A. Cushman. 2002. Comparative evaluation of experimental approaches to the study of habitat fragmentation effects. Ecological Applications **12**:335-345.

Michalski, F., and C. A. Peres. 2007. Disturbance-mediated mammal persistence and abundance-area relationships in Amazonian forest fragments. Conservation Biology **21**:1626-1640.

Mountford, M. D. 1988. Population Regulation, Density Dependence, and Heterogeneity. Journal of Animal Ecology **57**:845-858.

Murdoch, W. W., C. J. Briggs, and R. M. Nisbet. 2003. Consumer-Resource Dynamics. Princeton University Press, Princeton, NJ.

Mysterud, A., R. Langvatn, N. G. Yoccoz, and N. C. Stenseth. 2001. Plant phenology, migration and geographical variation in body weight of a large herbivore: the effect of a variable topography. Journal of Animal Ecology **70**:915-923.

Niemela, J. 2001. Carabid beetles (Coleoptera: Carabidae) and habitat fragmentation: a review. European Journal of Entomology **98**:127-132.

O'Neill, R. V., B. T. Milne, M. G. Turner, and R. H. Gardner. 1988. Resource utilization scales and landscape pattern. Landscape Ecology **2**:63-69.

Oyan, H. S., and T. Anker-Nilssen. 1996. Allocation of growth in food-stressed Atlantic puffin chicks. The Auk **113**:830-841.

Pasztor, L., E. Kisdi, and G. Meszena. 2000. Jensen's inequality and optimal life history strategies in stochastic environments. Trends in Ecology & Evolution **15**:117-118.

Pech, R. P., and G. M. Hood. 1998. Foxes, rabbits, alternative prey and rabbit calcivirus disease: consequences of a new biological control agent for an outbreaking species in Australia. Journal of Applied Ecology **35**:434-453.

Pineda, E., and G. Halffter. 2004. Species diversity and habitat fragmentation: frogs in a tropical montane landscape in Mexico. Biological Conservation **117**:499-508.

Polishchuk, L. V., and J. Vijverberg. 2005. Contribution analysis of body mass dynamics in *Daphnia*. Oecologia **144**:268-277.

Power, M. E. 1992. Top-down and bottom-up forces in food webs - Do plants have primacy. Ecology **73**:733-746.

Reinsel, K. A., P. S. Glas, J. R. Rayburn, M. K. Pritchard, and W. S. Fisher. 2001. Effects of food availability on survival, growth, and reproduction of the grass shrimp *Palaemonetes pugio*: a laboratory study. Marine Ecology-Progress Series **220**:231-239.

Rheault, R. B., and M. A. Rice. 1996. Food-limited growth and condition index in the eastern oyster, Crassostrea virginica (Gmelin 1791), and the bay scallop, Argopecten irradians irradians (Lamarck 1819). Journal of Shellfish Research **15**:271-283.

Rinke, K., and T. Petzoldt. 2003. Modelling the effects of temperature and food on individual growth and reproduction of Daphnia and their consequences on the population level. Limnologica **33**:293-304.

Roff, D. A. 1974. Analysis of a Population Model Demonstrating Importance of Dispersal in a Heterogeneous Environment. Oecologia **15**:259-275.

Root, R. B. 1973. Organization of a plant-arthropod association in simple and diverse habitats: the fauna of collards (*Brassica oleraciea*). Ecological Monographs **43**:95-124.

Ruel, J. J., and M. P. Ayres. 1999. Jensen's inequality predicts effects of environmental variation. Trends in Ecology & Evolution **14**:361-366.

Ryall, K. L., and L. Fahrig. 2006. Response of predators to loss and fragmentation of prey habitat: A review of theory. Ecology **87**:1086-1093.

Said, S., and S. Servanty. 2005. The influence of landscape structure on female roe deer home-range size. Landscape Ecology **20**:1003-1012.

Schwinning, S., and M. L. Rosenzweig. 1990. Periodic oscillations in an ideal-free predator-prey distribution. Oikos **59**:85-91.

Scott, D. E., and M. R. Fore. 1995. The effect of food limitation on lipid levels, growth, and reproduction in the marbled salamander, Ambystoma opacum. Herpetologica **51**:462-471.

Searle, K. R., N. T. Hobbs, B. A. Wunder, and L. A. Shipley. 2006. Preference in patchy landscapes: the influence of scale-specific intake rates and variance in reward. Behavioral Ecology **17**:315-323.

Senft, R. L., M. B. Coughenour, D. W. Bailey, L. R. Rittenhouse, O. E. Sala, and D. M. Swift. 1987. Large herbivore foraging and ecological hierarchies. Bioscience **37**:789-&.

Serrano, M., L. Sanz, J. Puig, and J. Pons. 2002. Landscape fragmentation caused by the transport network in Navarra (Spain) - Two-scale analysis and landscape integration assessment. Landscape and Urban Planning **58**:113-123.

Shorey, H. H., L. A. Andres, and R. L. Hale. 1962. The biology of *Trichoplusia ni* (Lepidoptera: Noctuidae). I. Life history and behavior. Annals of the Entomological Society of America **55**:591-597.

Sibly, R. M., and J. Hone. 2002. Population growth rate and its determinants: an overview. Philosophical Transactions of the Royal Society of London Series B-Biological Sciences **357**:1153-1170.

Sinclair, A. R. E., and C. J. Krebs. 2002. Complex numerical responses to top-down and bottom-up processes in vertebrate populations. Philosophical Transactions of the Royal Society of London Series B-Biological Sciences **357**:1221-1231.

Soo Hoo, C. R., D. L. Coudriet, and P. V. Vail. 1984. *Trichoplusia ni* (Lepidoptera: Noctuidae) larval development on wild and cultivated plants. Environmental Entomology **13**:843-846.

Southworth, J., D. Munroe, and H. Nagendra. 2004. Land cover change and landscape fragmentation - comparing the utility of continuous and discrete analyses for a western Honduras region. Agriculture Ecosystems & Environment **101**:185-205.

Spalinger, D. E., and N. T. Hobbs. 1992. Mechanisms of foraging in mammalian herbivores: New models of functional response. American Naturalist **140**:325-348.

Stelzer, C. 2001. Resource limitation and reproductive effort in a planktonic rotifer. Ecology **82**:2521-2533.

Stephens, S. E., D. N. Koons, J. J. Rotella, and D. W. Willey. 2003. Effects of habitat fragmentation on avian nesting success: a review of the evidence at multiple spatial scales. Biological Conservation **115**:101-110.

Tischendorf, L., A. Grez, T. Zaviezo, and L. Fahrig. 2005. Mechanisms affecting population density in fragmented habitat. Ecology and Society **10**.

Toba, H. H., A. N. Kishaba, R. Pangaldan, and P. V. Vail. 1973. Temperature and the development of the cabbage looper. Annals of the Entomological Society of America **66**:965-974.

Turchin, P., and G. O. Batzli. 2001. Availability of food and the population dynamics of arvicoline rodents. Ecology **82**:1521-1534.

van Nouhuys, S. 2005. Effects of habitat fragmentation at different trophic levels in insect communities. Annales Zoologici Fennici **42**:433-447.

Wang, G. M., N. T. Hobbs, R. B. Boone, A. W. Illius, I. J. Gordon, J. E. Gross, and K. L. Hamlin. 2006. Spatial and temporal variability modify density dependence in populations of large herbivores. Ecology **87**:95-102.

Wiegand, T., E. Revilla, and K. A. Moloney. 2005. Effects of habitat loss and fragmentation on population dynamics. Conservation Biology **19**:108-121.

Wiens, J. A. 1976. Population responses to patchy environments. Annual Review of Ecology and Systematics **7**:81-120.

Wiens, J. A. 1995. Habitat fragmentation - Island v landscape perspectives on bird conservation. Ibis **137**:S97-S104.

Zhu, M., N. Jiang, J. Li, J. Xu, and Y. Fan. 2006. The effects of sensor spatial resolution and changing grain size on fragmentation indices in urban landscape. International Journal of Remote Sensing **27**:4791-4805.

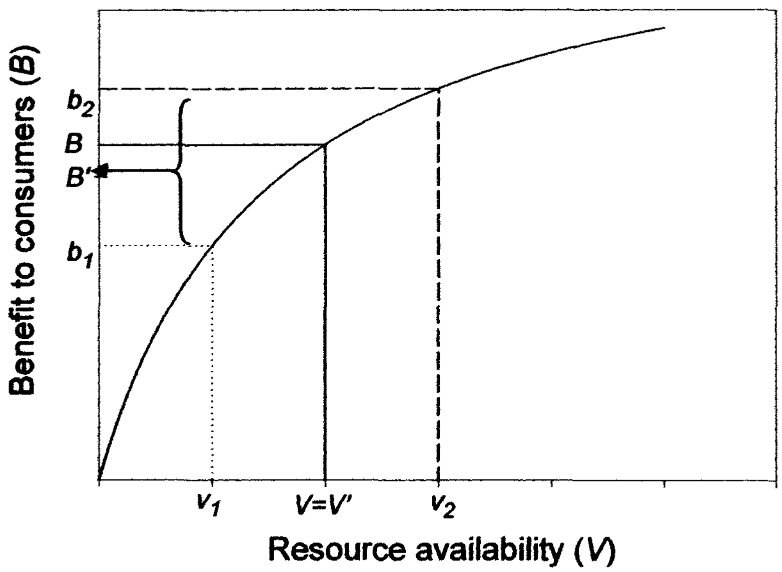

FIG. 1. Illustration of a decrease in average benefit without overall change in food availability. An intact landscape has food availability V and resultant consumer benefit B. After division into two fragments, the food availabilities of the two fragments are v_1 and v_2, and the average food availability on the landscape is $(v_1+v_2)/2=V'$. Benefit after fragmentation is $(b_1+b_2)/2=B'$. Average food availability is unchanged ($V=V'$). Gains in the average benefit due to b_2 are smaller than losses to the average benefit due to b_1; therefore, the average benefit is decreased as a result of nonlinearity in the function ($B'<B$).

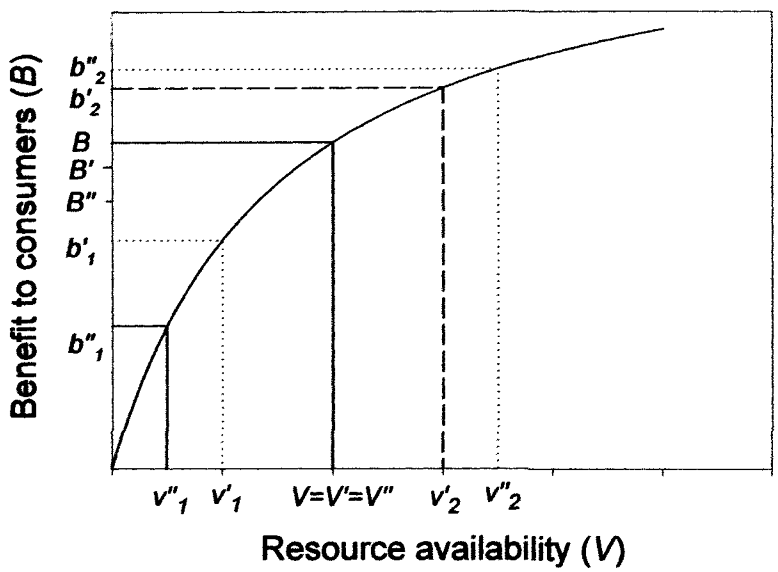

FIG. 2. Illustration of a decrease in average benefit with increasing variance in resource availability. An intact landscape has food availability *V* and resultant consumer benefit *B*. After division into two fragments, the average benefit is decreased as a result of nonlinearity in the function (*B*>*B'*). If a different division of the intact landscape yields two fragments with greater variance in v_i, benefit on the landscape (*B''*) is lower than the benefit yielded by the first, lower-variance division (*B*>*B'*>*B''*).

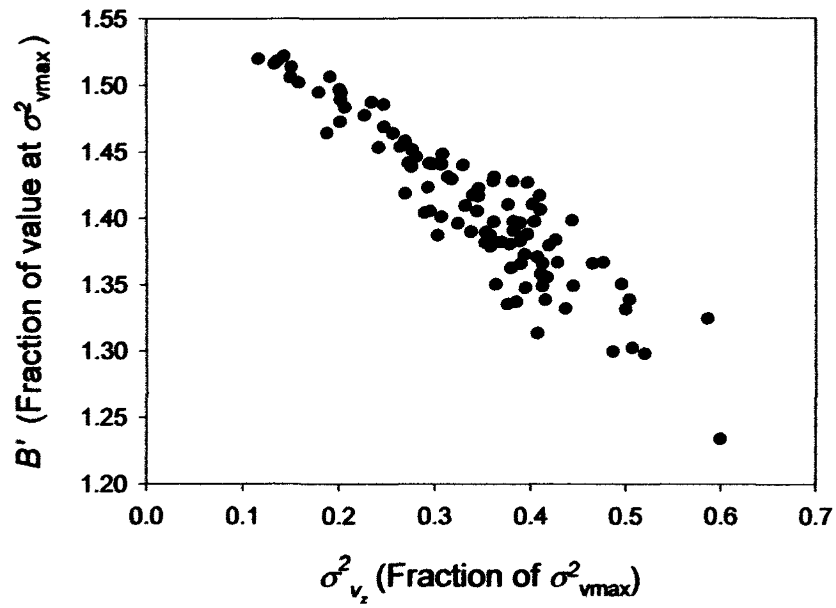

FIG. 3. Average benefit to consumers as a function of variance in resource availability among fragments. One hundred points represent landscapes divided into eight fragments each. Food availability values averaging 40 units were randomly generated for each fragment and consumer benefit calculated in each fragment as a function of food availability. Resource availability variance among fragments on each landscape (σ^2_{vz}) is presented as the proportion of the maximum possible value for variance at this fragmentation level (σ^2_{vmax}); average benefit on each landscape is presented as the fraction of B' at σ^2_{vmax}. The maximum possible benefit is realized in the unfragmented case, and in the fragmented case when σ^2_i=0. Minimum possible benefit is realized at σ^2_{vmax}.

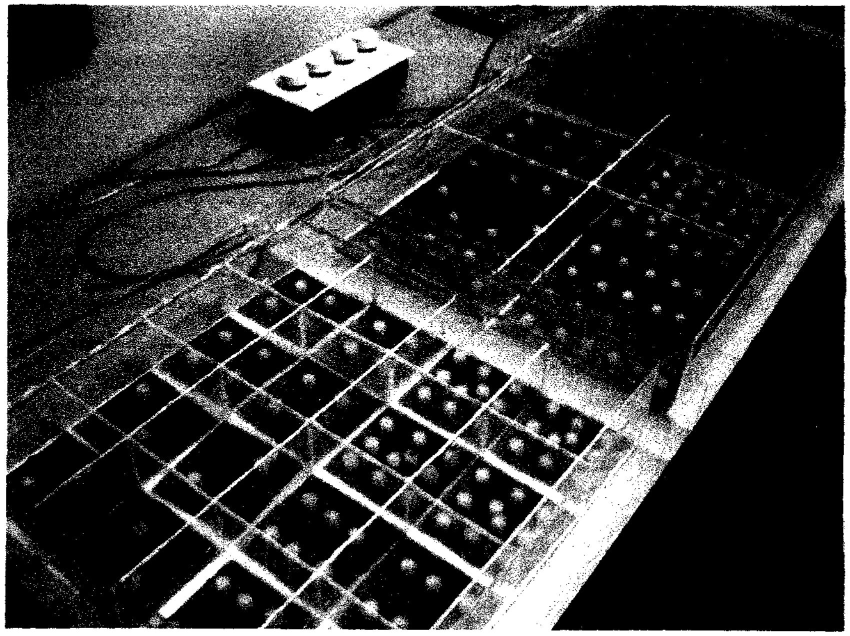

FIG. 4. Artificial landscapes used in laboratory experiment.

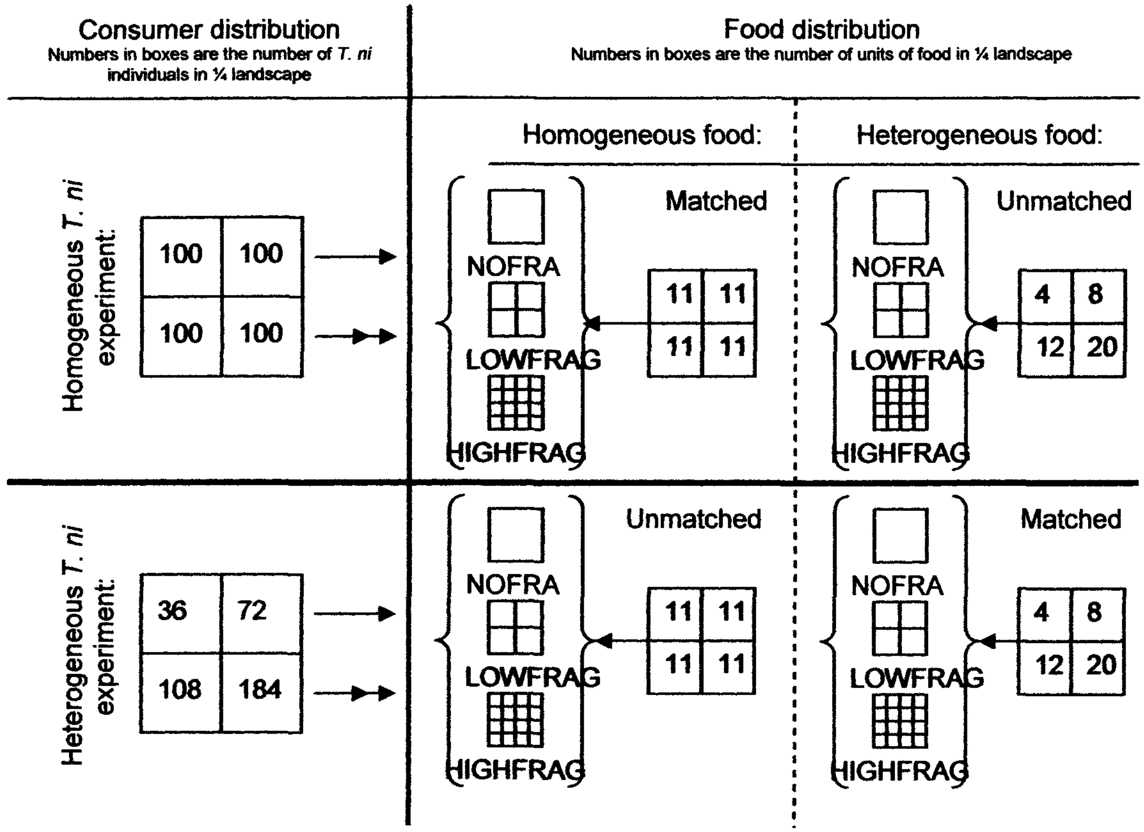

FIG. 5. Experimental design. Homogeneous *T. ni* and heterogeneous *T. ni* experiments each contain a matched treatment and an unmatched treatment. Food per consumer ratios are similar among all fragments in matched treatments. Each experimental block contains six landscapes, consisting of one class of consumer distribution (homogeneous or heterogeneous), two classes of food distribution (homogeneous and heterogeneous), and three levels of fragmentation. Levels of fragmentation are labeled as follows: NOFRAG = no fragmentation, LOWFRAG = low fragmentation, HIGHFRAG = high fragmentation.

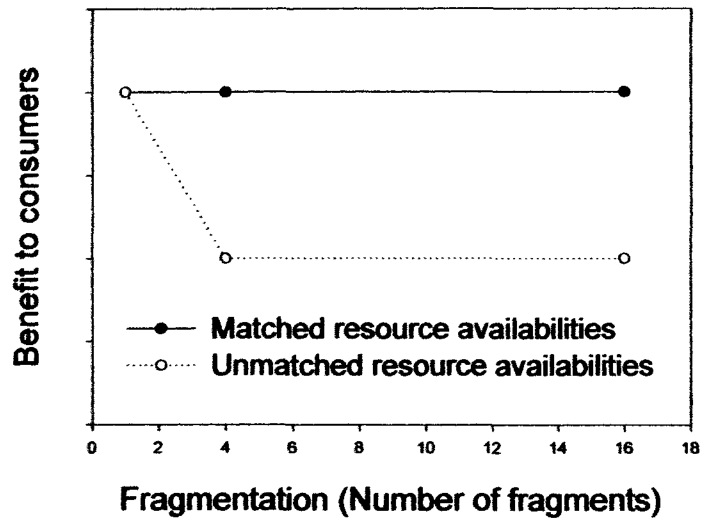

FIG. 6. Form of the hypothesized results of the experiment. Predicted differences in benefit between treatments are labeled H1, H2, and H3, summarized as follows:

H1: Hypothesis 1 (H1) postulates that benefit should be identical between matched and unmatched treatments when larvae have access to the entire landscape (no fragmentation treatment).

H2: Hypothesis 2 (H2) postulates that benefit should be lower in the low and high fragmentation treatments than in the no fragmentation treatments when food availabilities are unmatched. Because food availability ratios are identical among fragments in the low fragmentation and high fragmentation unmatched treatments, no difference in benefit is expected. No difference is expected among fragmentation treatments when food availabilities are matched.

H3: Hypothesis 3 (H3) postulates that benefit within a given level of fragmentation should be lower when food availabilities are unmatched than when they are matched.

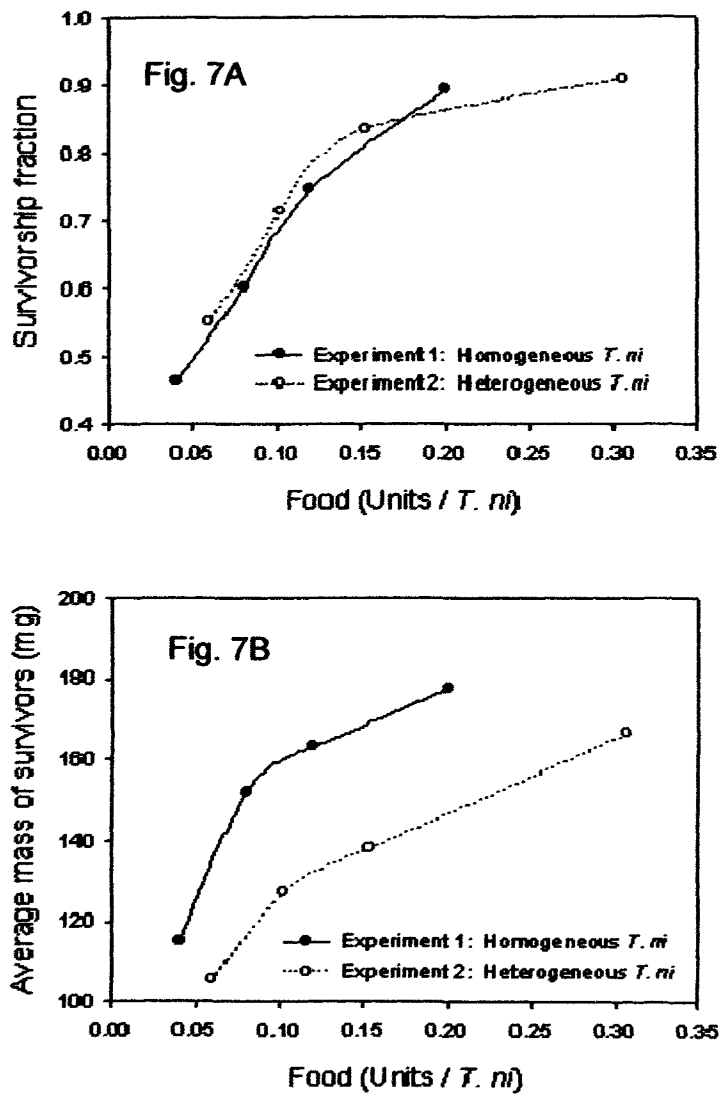

FIG. 7. Observed forms of the relationships between (A) survivorship and (B) average survivor mass and food availability in Experiments 1 and 2. The quadratic term was significant ($P<0.05$) in both sets of survivorship data and in homogeneous *T. ni* average mass data, indicating convexity. These relationships were evaluated

using data from fragmented high-variance landscapes in both experiments.

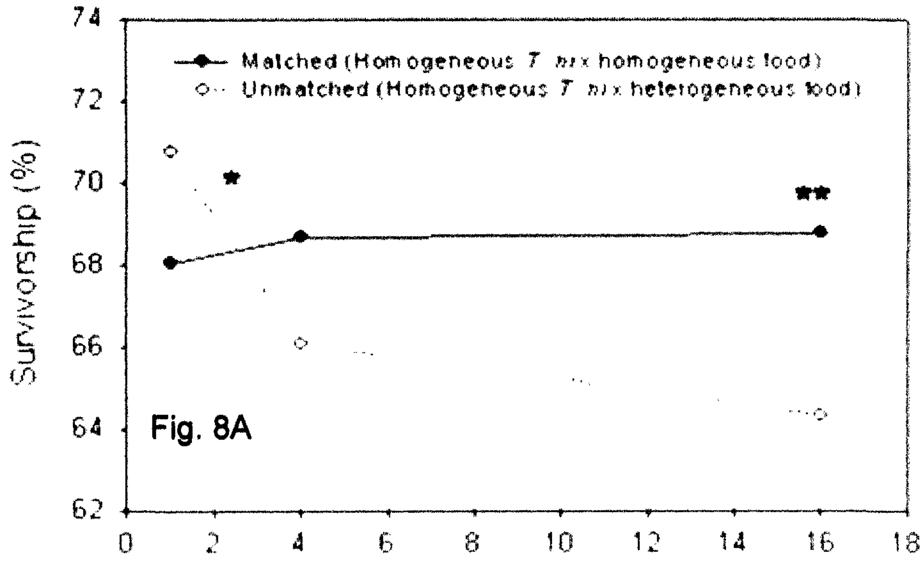
Fig. 8A
Survivorship (%)
Matched (Homogeneous T. ni x homogeneous food)
Unmatched (Homogeneous T. ni x heterogeneous food)
74
72
70
68
66
64
62
0
2
4
6
8
10
12
14
16
18
*
**

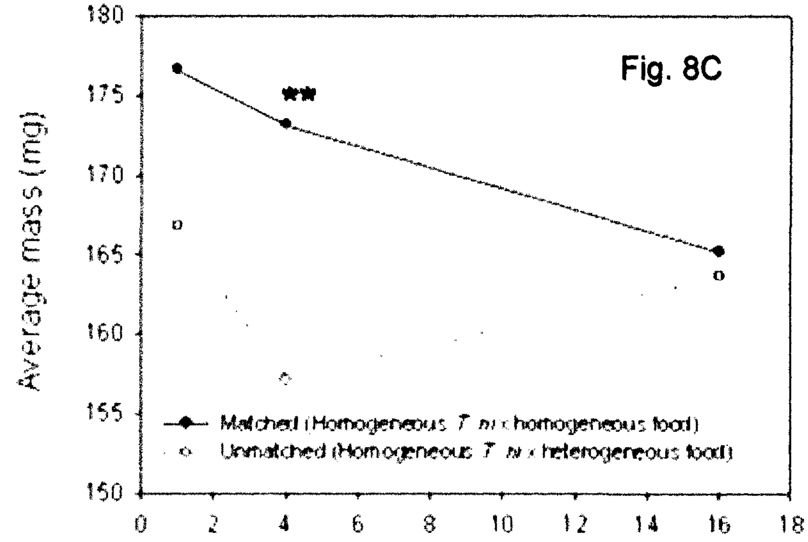
Fig. 8C
Average mass (mg)
Matched (Homogeneous T. ni x homogeneous food)
Unmatched (Homogeneous T. ni x heterogeneous food)
180
175
170
165
160
155
150
0
2
4
6
8
10
12
14
16
18
**

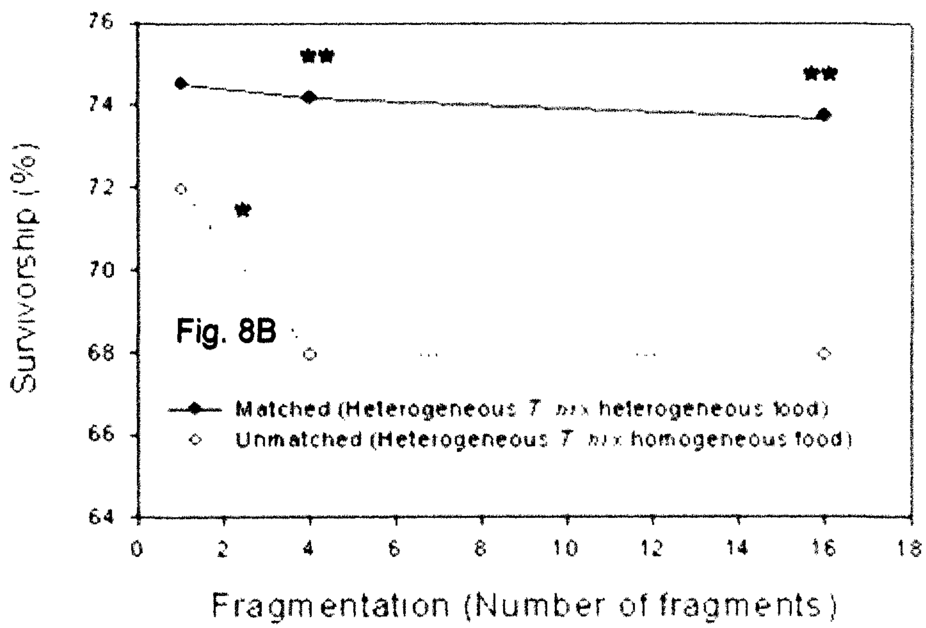
Fig. 8B
Survivorship (%)
Matched (Heterogeneous T. ni x heterogeneous food)
Unmatched (Heterogeneous T. ni x homogeneous food)
76
74
72
70
68
66
64
0
2
4
6
8
10
12
14
16
18
*
**
Fragmentation (Number of fragments)

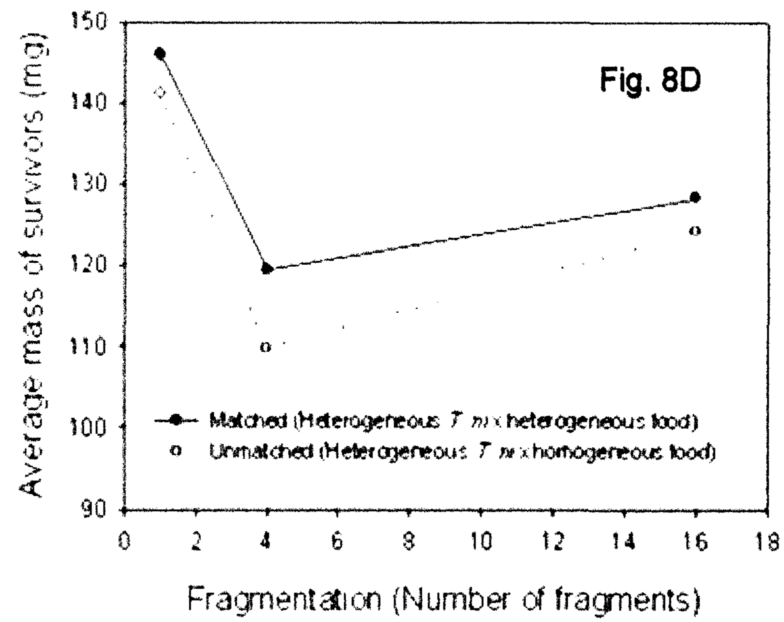
Fig. 8D
Average mass of survivors (mg)
Matched (Heterogeneous T. ni x heterogeneous food)
Unmatched (Heterogeneous T. ni x homogeneous food)
150
140
130
120
110
100
90
0
2
4
6
8
10
12
14
16
18
Fragmentation (Number of fragments)

FIG. 8. Consumer benefit across three levels of fragmentation in matched and unmatched treatments. Survivorship is shown in (A) Experiment 1 and (B) Experiment 2. Average survivor mass is shown in (C) Experiment 1 and (D) Experiment 2. Asterisks on a line indicate a statistically significant difference ($p<.05$) in survivorship between the two treatments connected by the line. Double asterisks indicate a difference between matched and unmatched treatments at a given level of fragmentation.

Appendix A. Survivorship and survivor mass for all fragments in all treatments. Each line is compiled data for one fragment. For mass of individuals in selected treatments, see Appendix B. Column headings are as follows:

EXPERIMENT: Experiment 1, in which all T. ni are distributed evenly across the landscape, is coded as 1. Experiment 2, in which all T. ni are distributed unevenly among the four quarters of a landscape, is coded as 2.
REP: Experiment 1 was repeated five times, coded 1 through 5; experiment 2 repetitions are coded 6 through 10.
T. NI: TNIHOM indicates that T. ni were distributed homogeneously. TNIHET indicates that T. ni were distributed heterogeneously.
FOOD: HET indicates that food was distributed heterogeneously. HOM indicates homogeneous food distribution.
M/UM: Matched treatments are coded as M, unmatched treatments as UM.
FRAG: Fragmentation levels are HIGH, LOW, or NO (no fragmentation).
FOODAMT: The number of units of food in the fragment.
INTRO TNI: The number of T. ni individuals initially introduced into the fragment.
SURVIVORS: The number of surviving T. ni at harvest.
BIOMASS: Total mass of the survivors in the fragment (mg).

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	FOODAMT	INTRO TNI	SURVIVORS	BIOMASS
1	1	TNIHOM	HET	UM	HIGH	2	25	11	1418
1	1	TNIHOM	HET	UM	HIGH	2	25	10	1084
1	1	TNIHOM	HET	UM	HIGH	2	25	10	800
1	1	TNIHOM	HET	UM	HIGH	2	25	9	920
1	1	TNIHOM	HET	UM	HIGH	4	25	11	1886
1	1	TNIHOM	HET	UM	HIGH	4	25	13	2003
1	1	TNIHOM	HET	UM	HIGH	4	25	14	1881
1	1	TNIHOM	HET	UM	HIGH	4	25	12	1926
1	1	TNIHOM	HET	UM	HIGH	6	25	17	2395
1	1	TNIHOM	HET	UM	HIGH	6	25	14	2053
1	1	TNIHOM	HET	UM	HIGH	6	25	19	2238
1	1	TNIHOM	HET	UM	HIGH	6	25	15	2290
1	1	TNIHOM	HET	UM	HIGH	10	25	25	3814
1	1	TNIHOM	HET	UM	HIGH	10	25	21	3298
1	1	TNIHOM	HET	UM	HIGH	10	25	27	4076
1	1	TNIHOM	HET	UM	HIGH	10	25	20	2648
1	1	TNIHOM	HET	UM	LOW	8	100	42	4139
1	1	TNIHOM	HET	UM	LOW	16	100	48	6198
1	1	TNIHOM	HET	UM	LOW	24	100	87	11734
1	1	TNIHOM	HET	UM	LOW	40	100	113	17060
1	1	TNIHOM	HET	UM	NO	88	400	281	41050
1	1	TNIHOM	HOM	M	HIGH	5.5	25	15	2022
1	1	TNIHOM	HOM	M	HIGH	5.5	25	18	2312
1	1	TNIHOM	HOM	M	HIGH	5.5	25	19	2485
1	1	TNIHOM	HOM	M	HIGH	5.5	25	19	2426
1	1	TNIHOM	HOM	M	HIGH	5.5	25	16	2037
1	1	TNIHOM	HOM	M	HIGH	5.5	25	14	1878
1	1	TNIHOM	HOM	M	HIGH	5.5	25	15	2072
1	1	TNIHOM	HOM	M	HIGH	5.5	25	17	2153
1	1	TNIHOM	HOM	M	HIGH	5.5	25	22	2447
1	1	TNIHOM	HOM	M	HIGH	5.5	25	16	2323
1	1	TNIHOM	HOM	M	HIGH	5.5	25	14	1991
1	1	TNIHOM	HOM	M	HIGH	5.5	25	18	2336
1	1	TNIHOM	HOM	M	HIGH	5.5	25	18	2303
1	1	TNIHOM	HOM	M	HIGH	5.5	25	16	1870
1	1	TNIHOM	HOM	M	HIGH	5.5	25	18	2382
1	1	TNIHOM	HOM	M	HIGH	5.5	25	16	2424
1	1	TNIHOM	HOM	M	LOW	22	100	77	10492
1	1	TNIHOM	HOM	M	LOW	22	100	58	7990
1	1	TNIHOM	HOM	M	LOW	22	100	69	10028
1	1	TNIHOM	HOM	M	LOW	22	100	95	11064
1	1	TNIHOM	HOM	M	NO	88	400	305	42770

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	FOODAMT	INTRO TNI	SURVIVORS	BIOMASS
1	2	TNIHOM	HET	UM	HIGH	2	25	7	873
1	2	TNIHOM	HET	UM	HIGH	2	25	8	996
1	2	TNIHOM	HET	UM	HIGH	2	25	8	989
1	2	TNIHOM	HET	UM	HIGH	2	25	7	822
1	2	TNIHOM	HET	UM	HIGH	4	25	17	2092
1	2	TNIHOM	HET	UM	HIGH	4	25	12	1611
1	2	TNIHOM	HET	UM	HIGH	4	25	14	1810
1	2	TNIHOM	HET	UM	HIGH	4	25	10	1611
1	2	TNIHOM	HET	UM	HIGH	6	25	14	2196
1	2	TNIHOM	HET	UM	HIGH	6	25	16	2466
1	2	TNIHOM	HET	UM	HIGH	6	25	15	2351
1	2	TNIHOM	HET	UM	HIGH	6	25	14	2250
1	2	TNIHOM	HET	UM	HIGH	10	25	21	3701
1	2	TNIHOM	HET	UM	HIGH	10	25	19	3005
1	2	TNIHOM	HET	UM	HIGH	10	25	20	3398
1	2	TNIHOM	HET	UM	HIGH	10	25	20	3214
1	2	TNIHOM	HET	UM	LOW	8	100	37	3428
1	2	TNIHOM	HET	UM	LOW	16	100	54	5767
1	2	TNIHOM	HET	UM	LOW	24	100	70	9492
1	2	TNIHOM	HET	UM	LOW	40	100	96	14996
1	2	TNIHOM	HET	UM	NO	88	400	283	36562
1	2	TNIHOM	HOM	M	HIGH	5.5	25	13	2008
1	2	TNIHOM	HOM	M	HIGH	5.5	25	17	2518
1	2	TNIHOM	HOM	M	HIGH	5.5	25	16	2399
1	2	TNIHOM	HOM	M	HIGH	5.5	25	16	2250
1	2	TNIHOM	HOM	M	HIGH	.	.	.	.
1	2	TNIHOM	HOM	M	HIGH	.	.	.	.
1	2	TNIHOM	HOM	M	HIGH	.	.	.	.
1	2	TNIHOM	HOM	M	HIGH	.	.	.	.
1	2	TNIHOM	HOM	M	HIGH	5.5	25	18	2659
1	2	TNIHOM	HOM	M	HIGH	.	.	.	.
1	2	TNIHOM	HOM	M	HIGH	.	.	.	.
1	2	TNIHOM	HOM	M	HIGH	.	.	.	.
1	2	TNIHOM	HOM	M	HIGH	5.5	25	15	2274
1	2	TNIHOM	HOM	M	HIGH	5.5	25	14	2051
1	2	TNIHOM	HOM	M	HIGH	5.5	25	14	2049
1	2	TNIHOM	HOM	M	HIGH	5.5	25	15	2172
1	2	TNIHOM	HOM	M	LOW	22	100	66	9129
1	2	TNIHOM	HOM	M	LOW	22	100	58	9770
1	2	TNIHOM	HOM	M	LOW	.	.	.	.
1	2	TNIHOM	HOM	M	LOW	.	.	.	.
1	2	TNIHOM	HOM	M	NO	88	400	244	36.531
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1	3	TNIHOM	HET	UM	HIGH	2	25	12	1469
1	3	TNIHOM	HET	UM	HIGH	4	25	14	2288
1	3	TNIHOM	HET	UM	HIGH	4	25	12	2375
1	3	TNIHOM	HET	UM	HIGH	4	25	15	2708
1	3	TNIHOM	HET	UM	HIGH	4	25	13	2452
1	3	TNIHOM	HET	UM	HIGH	6	25	24	4054
1	3	TNIHOM	HET	UM	HIGH	6	25	20	3690
1	3	TNIHOM	HET	UM	HIGH	6	25	21	3962
1	3	TNIHOM	HET	UM	HIGH	6	25	21	3707
1	3	TNIHOM	HET	UM	HIGH	10	25	24	5635
1	3	TNIHOM	HET	UM	HIGH	10	25	21	5030
1	3	TNIHOM	HET	UM	HIGH	10	25	24	5470
1	3	TNIHOM	HET	UM	HIGH	10	25	21	4598
1	3	TNIHOM	HET	UM	LOW	8	100	49	6563
1	3	TNIHOM	HET	UM	LOW	16	100	64	12145
1	3	TNIHOM	HET	UM	LOW	24	100	82	17313
1	3	TNIHOM	HET	UM	LOW	40	100	98	21809
1	3	TNIHOM	HET	UM	NO	88	400	321	62331

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	FOODAMT	INTRO TNI	SURVIVORS	BIOMASS
1	3	TNIHOM	HOM	M	HIGH	5.5	25	24	3887
1	3	TNIHOM	HOM	M	HIGH	5.5	25	26	4256
1	3	TNIHOM	HOM	M	HIGH	5.5	25	22	4021
1	3	TNIHOM	HOM	M	HIGH	5.5	25	23	4380
1	3	TNIHOM	HOM	M	HIGH	5.5	25	21	4403
1	3	TNIHOM	HOM	M	HIGH	5.5	25	19	3894
1	3	TNIHOM	HOM	M	HIGH	5.5	25	25	3852
1	3	TNIHOM	HOM	M	HIGH	5.5	25	21	4054
1	3	TNIHOM	HOM	M	HIGH	5.5	25	24	3868
1	3	TNIHOM	HOM	M	HIGH	5.5	25	22	4642
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1	3	TNIHOM	HOM	M	HIGH	.	.	.	.
1	3	TNIHOM	HOM	M	HIGH	5.5	25	22	3283
1	3	TNIHOM	HOM	M	HIGH	5.5	25	16	3040
1	3	TNIHOM	HOM	M	HIGH	.	.	.	.
1	3	TNIHOM	HOM	M	HIGH	.	.	.	.
1	3	TNIHOM	HOM	M	LOW	22	100	96	17291
1	3	TNIHOM	HOM	M	LOW	22	100	84	17355
1	3	TNIHOM	HOM	M	LOW	22	100	82	14977
1	3	TNIHOM	HOM	M	LOW	22	100	90	16599
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1	4	TNIHOM	HET	UM	HIGH	2	25	20	1508
1	4	TNIHOM	HET	UM	HIGH	2	25	17	1646
1	4	TNIHOM	HET	UM	HIGH	2	25	20	1466
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1	4	TNIHOM	HET	UM	HIGH	6	25	23	3959
1	4	TNIHOM	HET	UM	HIGH	6	25	25	2886
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1	4	TNIHOM	HOM	M	HIGH	5.5	25	15	1456
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1	4	TNIHOM	HOM	M	HIGH	5.5	25	25	3263
1	4	TNIHOM	HOM	M	HIGH	5.5	25	19	1282
1	4	TNIHOM	HOM	M	HIGH	5.5	25	24	2600
1	4	TNIHOM	HOM	M	HIGH	5.5	25	22	1982
1	4	TNIHOM	HOM	M	HIGH	5.5	25	21	2073
1	4	TNIHOM	HOM	M	HIGH	5.5	25	24	3109
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1	4	TNIHOM	HOM	M	HIGH	5.5	25	25	2840
1	4	TNIHOM	HOM	M	HIGH	5.5	25	23	2909
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1	4	TNIHOM	HOM	M	LOW	22	100	64	6037
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1	4	TNIHOM	HOM	M	NO	88	400	251	48264

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	FOODAMT	INTRO TNI	SURVIVORS	BIOMASS
1	5	TNIHOM	HET	UM	HIGH	2	25	8	1370
1	5	TNIHOM	HET	UM	HIGH	2	25	9	1283
1	5	TNIHOM	HET	UM	HIGH	2	25	10	1441
1	5	TNIHOM	HET	UM	HIGH	2	25	11	1504
1	5	TNIHOM	HET	UM	HIGH	4	25	14	2389
1	5	TNIHOM	HET	UM	HIGH	4	25	15	2592
1	5	TNIHOM	HET	UM	HIGH	4	25	16	3110
1	5	TNIHOM	HET	UM	HIGH	4	25	13	2335
1	5	TNIHOM	HET	UM	HIGH	6	25	17	3108
1	5	TNIHOM	HET	UM	HIGH	6	25	17	3490
1	5	TNIHOM	HET	UM	HIGH	6	25	16	3030
1	5	TNIHOM	HET	UM	HIGH	6	25	15	3077
1	5	TNIHOM	HET	UM	HIGH	10	25	22	4573
1	5	TNIHOM	HET	UM	HIGH	10	25	21	4543
1	5	TNIHOM	HET	UM	HIGH	10	25	20	4110
1	5	TNIHOM	HET	UM	HIGH	10	25	22	4254
1	5	TNIHOM	HET	UM	LOW	8	100	42	5447
1	5	TNIHOM	HET	UM	LOW	16	100	51	7848
1	5	TNIHOM	HET	UM	LOW	24	100	65	11781
1	5	TNIHOM	HET	UM	LOW	40	100	83	13778
1	5	TNIHOM	HET	UM	NO	88	400	265	48286
1	5	TNIHOM	HOM	M	HIGH	5.5	25	15	2659
1	5	TNIHOM	HOM	M	HIGH	5.5	25	17	3042
1	5	TNIHOM	HOM	M	HIGH	5.5	25	17	3173
1	5	TNIHOM	HOM	M	HIGH	5.5	25	15	2774
1	5	TNIHOM	HOM	M	HIGH	5.5	25	17	2852
1	5	TNIHOM	HOM	M	HIGH	5.5	25	15	2828
1	5	TNIHOM	HOM	M	HIGH	5.5	25	17	3158
1	5	TNIHOM	HOM	M	HIGH	5.5	25	15	2690
1	5	TNIHOM	HOM	M	HIGH	5.5	25	15	2770
1	5	TNIHOM	HOM	M	HIGH	5.5	25	16	2961
1	5	TNIHOM	HOM	M	HIGH	5.5	25	15	3024
1	5	TNIHOM	HOM	M	HIGH	5.5	25	16	3116
1	5	TNIHOM	HOM	M	HIGH	5.5	25	16	2783
1	5	TNIHOM	HOM	M	HIGH	5.5	25	17	3073
1	5	TNIHOM	HOM	M	HIGH	5.5	25	16	3167
1	5	TNIHOM	HOM	M	HIGH	5.5	25	14	2522
1	5	TNIHOM	HOM	M	LOW	22	100	65	12207
1	5	TNIHOM	HOM	M	LOW	22	100	59	11521
1	5	TNIHOM	HOM	M	LOW	22	100	57	11588
1	5	TNIHOM	HOM	M	LOW	22	100	56	11236
1	5	TNIHOM	HOM	M	NO	88	400	251	48264
2	6	TNIHET	HOM	UM	HIGH	5.5	46	29	2688
2	6	TNIHET	HOM	UM	HIGH	5.5	46	28	2295
2	6	TNIHET	HOM	UM	HIGH	5.5	46	26	2956
2	6	TNIHET	HOM	UM	HIGH	5.5	46	23	2948
2	6	TNIHET	HOM	UM	HIGH	5.5	27	22	2909
2	6	TNIHET	HOM	UM	HIGH	5.5	27	24	2834
2	6	TNIHET	HOM	UM	HIGH	5.5	27	20	2886
2	6	TNIHET	HOM	UM	HIGH	5.5	27	18	2414
2	6	TNIHET	HOM	UM	HIGH	5.5	18	17	1947
2	6	TNIHET	HOM	UM	HIGH	5.5	18	18	2056
2	6	TNIHET	HOM	UM	HIGH	5.5	18	17	2628
2	6	TNIHET	HOM	UM	HIGH	5.5	18	16	2547
2	6	TNIHET	HOM	UM	HIGH	5.5	9	9	1695
2	6	TNIHET	HOM	UM	HIGH	5.5	9	8	1748
2	6	TNIHET	HOM	UM	HIGH	5.5	9	9	1476
2	6	TNIHET	HOM	UM	HIGH	5.5	9	8	1803
2	6	TNIHET	HOM	UM	LOW	22	184	112	12522
2	6	TNIHET	HOM	UM	LOW	22	108	76	10399
2	6	TNIHET	HOM	UM	LOW	22	72	58	9418
2	6	TNIHET	HOM	UM	LOW	22	36	35	.
2	6	TNIHET	HOM	UM	NO	88	400	314	43630

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	FOODAMT	INTRO TNI	SURVIVORS	BIOMASS
2	6	TNIHET	HET	M	HIGH	10	46	34	5522
2	6	TNIHET	HET	M	HIGH	10	46	32	5387
2	6	TNIHET	HET	M	HIGH	10	46	29	4922
2	6	TNIHET	HET	M	HIGH	10	46	36	5537
2	6	TNIHET	HET	M	HIGH	6	27	23	2920
2	6	TNIHET	HET	M	HIGH	6	27	20	3430
2	6	TNIHET	HET	M	HIGH	6	27	23	3263
2	6	TNIHET	HET	M	HIGH	6	27	21	3486
2	6	TNIHET	HET	M	HIGH	4	18	14	2382
2	6	TNIHET	HET	M	HIGH	4	18	15	2323
2	6	TNIHET	HET	M	HIGH	4	18	14	2393
2	6	TNIHET	HET	M	HIGH	4	18	14	2378
2	6	TNIHET	HET	M	HIGH	2	9	7	1179
2	6	TNIHET	HET	M	HIGH	2	9	9	1298
2	6	TNIHET	HET	M	HIGH	2	9	7	1045
2	6	TNIHET	HET	M	HIGH	2	9	8	1279
2	6	TNIHET	HET	M	LOW	40	184	150	23910
2	6	TNIHET	HET	M	LOW	24	108	81	14225
2	6	TNIHET	HET	M	LOW	16	72	54	9268
2	6	TNIHET	HET	M	LOW	8	36	32	4299
2	6	TNIHET	HET	M	NO	88	400	336	53030
2	7	TNIHET	HOM	UM	HIGH	5.5	46	24	2510
2	7	TNIHET	HOM	UM	HIGH	5.5	46	29	2648
2	7	TNIHET	HOM	UM	HIGH	5.5	46	24	3065
2	7	TNIHET	HOM	UM	HIGH	5.5	46	24	3226
2	7	TNIHET	HOM	UM	HIGH	5.5	27	18	3201
2	7	TNIHET	HOM	UM	HIGH	5.5	27	18	2780
2	7	TNIHET	HOM	UM	HIGH	5.5	27	21	3104
2	7	TNIHET	HOM	UM	HIGH	5.5	27	22	3253
2	7	TNIHET	HOM	UM	HIGH	5.5	18	16	3000
2	7	TNIHET	HOM	UM	HIGH	5.5	18	18	2819
2	7	TNIHET	HOM	UM	HIGH	5.5	18	17	2252
2	7	TNIHET	HOM	UM	HIGH	5.5	18	13	2404
2	7	TNIHET	HOM	UM	HIGH	5.5	9	9	2024
2	7	TNIHET	HOM	UM	HIGH	5.5	9	9	1938
2	7	TNIHET	HOM	UM	HIGH	5.5	9	9	1673
2	7	TNIHET	HOM	UM	HIGH	5.5	9	9	1860
2	7	TNIHET	HOM	UM	LOW	22	184	123	13062
2	7	TNIHET	HOM	UM	LOW	22	108	83	11228
2	7	TNIHET	HOM	UM	LOW	22	72	64	9403
2	7	TNIHET	HOM	UM	LOW	22	36	36	6487
2	7	TNIHET	HOM	UM	NO	88	400	309	47040
2	7	TNIHET	HET	M	HIGH	10	46	35	5139
2	7	TNIHET	HET	M	HIGH	10	46	31	5224
2	7	TNIHET	HET	M	HIGH	10	46	29	5481
2	7	TNIHET	HET	M	HIGH	10	46	30	5949
2	7	TNIHET	HET	M	HIGH	6	27	19	1908
2	7	TNIHET	HET	M	HIGH	6	27	18	2829
2	7	TNIHET	HET	M	HIGH	6	27	19	3067
2	7	TNIHET	HET	M	HIGH	6	27	21	3016
2	7	TNIHET	HET	M	HIGH	4	18	13	1869
2	7	TNIHET	HET	M	HIGH	4	18	16	2146
2	7	TNIHET	HET	M	HIGH	4	18	15	1996
2	7	TNIHET	HET	M	HIGH	4	18	17	2021
2	7	TNIHET	HET	M	HIGH	2	9	8	1239
2	7	TNIHET	HET	M	HIGH	2	9	6	397
2	7	TNIHET	HET	M	HIGH	2	9	9	951
2	7	TNIHET	HET	M	HIGH	2	9	9	618
2	7	TNIHET	HET	M	LOW	40	184	156	20762
2	7	TNIHET	HET	M	LOW	24	108	82	11032
2	7	TNIHET	HET	M	LOW	16	72	50	5807
2	7	TNIHET	HET	M	LOW	8	36	29	3515
2	7	TNIHET	HET	M	NO	88	400	308	49520

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	FOODAMT	INTRO TNI	SURVIVORS	BIOMASS
2	8	TNIHET	HOM	UM	HIGH	5.5	46	29	2640
2	8	TNIHET	HOM	UM	HIGH	5.5	46	26	3019
2	8	TNIHET	HOM	UM	HIGH	5.5	46	27	2895
2	8	TNIHET	HOM	UM	HIGH	5.5	46	26	3012
2	8	TNIHET	HOM	UM	HIGH	5.5	27	21	2759
2	8	TNIHET	HOM	UM	HIGH	5.5	27	22	2768
2	8	TNIHET	HOM	UM	HIGH	5.5	27	22	2873
2	8	TNIHET	HOM	UM	HIGH	5.5	27	21	3000
2	8	TNIHET	HOM	UM	HIGH	5.5	18	13	2611
2	8	TNIHET	HOM	UM	HIGH	5.5	18	18	2610
2	8	TNIHET	HOM	UM	HIGH	5.5	18	15	2327
2	8	TNIHET	HOM	UM	HIGH	5.5	18	15	.
2	8	TNIHET	HOM	UM	HIGH	5.5	9	9	1322
2	8	TNIHET	HOM	UM	HIGH	5.5	9	9	1790
2	8	TNIHET	HOM	UM	HIGH	5.5	9	7	1365
2	8	TNIHET	HOM	UM	HIGH	5.5	9	9	1407
2	8	TNIHET	HOM	UM	LOW	22	184	108	12721
2	8	TNIHET	HOM	UM	LOW	22	108	86	12886
2	8	TNIHET	HOM	UM	LOW	22	72	64	9507
2	8	TNIHET	HOM	UM	LOW	22	36	34	7055
2	8	TNIHET	HOM	UM	NO	88	400	313	49663
2	8	TNIHET	HET	M	HIGH	10	46	37	4330
2	8	TNIHET	HET	M	HIGH	10	46	42	5282
2	8	TNIHET	HET	M	HIGH	10	46	30	4384
2	8	TNIHET	HET	M	HIGH	10	46	34	4574
2	8	TNIHET	HET	M	HIGH	6	27	20	2712
2	8	TNIHET	HET	M	HIGH	6	27	20	2959
2	8	TNIHET	HET	M	HIGH	6	27	24	2927
2	8	TNIHET	HET	M	HIGH	6	27	20	2632
2	8	TNIHET	HET	M	HIGH	4	18	16	960
2	8	TNIHET	HET	M	HIGH	4	18	14	1375
2	8	TNIHET	HET	M	HIGH	4	18	13	1167
2	8	TNIHET	HET	M	HIGH	4	18	14	1808
2	8	TNIHET	HET	M	HIGH	2	9	9	654
2	8	TNIHET	HET	M	HIGH	2	9	8	1056
2	8	TNIHET	HET	M	HIGH	2	9	8	1112
2	8	TNIHET	HET	M	HIGH	2	9	8	931
2	8	TNIHET	HET	M	LOW	40	184	160	20134
2	8	TNIHET	HET	M	LOW	24	108	84	9519
2	8	TNIHET	HET	M	LOW	16	72	53	5174
2	8	TNIHET	HET	M	LOW	8	36	31	2933
2	8	TNIHET	HET	M	NO	88	400	344	50414
2	9	TNIHET	HOM	UM	HIGH	5.5	46	35	3003
2	9	TNIHET	HOM	UM	HIGH	5.5	46	35	3070
2	9	TNIHET	HOM	UM	HIGH	5.5	46	37	2858
2	9	TNIHET	HOM	UM	HIGH	5.5	46	31	2885
2	9	TNIHET	HOM	UM	HIGH	5.5	27	24	2340
2	9	TNIHET	HOM	UM	HIGH	5.5	27	22	2541
2	9	TNIHET	HOM	UM	HIGH	5.5	27	23	2671
2	9	TNIHET	HOM	UM	HIGH	5.5	27	22	2676
2	9	TNIHET	HOM	UM	HIGH	5.5	18	18	2186
2	9	TNIHET	HOM	UM	HIGH	5.5	18	18	2305
2	9	TNIHET	HOM	UM	HIGH	5.5	18	17	1986
2	9	TNIHET	HOM	UM	HIGH	5.5	18	17	1925
2	9	TNIHET	HOM	UM	HIGH	5.5	9	7	964
2	9	TNIHET	HOM	UM	HIGH	5.5	9	8	975
2	9	TNIHET	HOM	UM	HIGH	5.5	9	9	1665
2	9	TNIHET	HOM	UM	HIGH	5.5	9	8	910
2	9	TNIHET	HOM	UM	LOW	22	184	129	11500
2	9	TNIHET	HOM	UM	LOW	22	108	102	8165
2	9	TNIHET	HOM	UM	LOW	22	72	67	6246
2	9	TNIHET	HOM	UM	LOW	22	36	35	5082
2	9	TNIHET	HOM	UM	NO	88	400	347	36189

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	FOODAMT	INTRO TNI	SURVIVORS	BIOMASS
2	9	TNIHET	HET	M	HIGH	10	46	43	4014
2	9	TNIHET	HET	M	HIGH	10	46	44	4629
2	9	TNIHET	HET	M	HIGH	10	46	45	4252
2	9	TNIHET	HET	M	HIGH	10	46	41	3651
2	9	TNIHET	HET	M	HIGH	6	27	23	2043
2	9	TNIHET	HET	M	HIGH	6	27	27	2931
2	9	TNIHET	HET	M	HIGH	6	27	25	2872
2	9	TNIHET	HET	M	HIGH	6	27	26	2848
2	9	TNIHET	HET	M	HIGH	4	18	14	1664
2	9	TNIHET	HET	M	HIGH	4	18	16	1809
2	9	TNIHET	HET	M	HIGH	4	18	17	1398
2	9	TNIHET	HET	M	HIGH	4	18	17	1579
2	9	TNIHET	HET	M	HIGH	2	9	9	920
2	9	TNIHET	HET	M	HIGH	2	9	9	820
2	9	TNIHET	HET	M	HIGH	2	9	9	920
2	9	TNIHET	HET	M	HIGH	2	9	9	616
2	9	TNIHET	HET	M	LOW	40	184	170	13766
2	9	TNIHET	HET	M	LOW	24	108	100	5763
2	9	TNIHET	HET	M	LOW	16	72	69	4770
2	9	TNIHET	HET	M	LOW	8	36	31	2468
2	9	TNIHET	HET	M	NO	88	400	324	47470
2	10	TNIHET	HOM	UM	HIGH	5.5	46	15	1690
2	10	TNIHET	HOM	UM	HIGH	5.5	46	13	1690
2	10	TNIHET	HOM	UM	HIGH	5.5	46	13	1190
2	10	TNIHET	HOM	UM	HIGH	5.5	46	9	1043
2	10	TNIHET	HOM	UM	HIGH	5.5	27	9	1030
2	10	TNIHET	HOM	UM	HIGH	5.5	27	13	1469
2	10	TNIHET	HOM	UM	HIGH	5.5	27	13	937
2	10	TNIHET	HOM	UM	HIGH	5.5	27	12	1630
2	10	TNIHET	HOM	UM	HIGH	5.5	18	10	1173
2	10	TNIHET	HOM	UM	HIGH	5.5	18	11	1433
2	10	TNIHET	HOM	UM	HIGH	5.5	18	11	1213
2	10	TNIHET	HOM	UM	HIGH	5.5	18	10	1162
2	10	TNIHET	HOM	UM	HIGH	5.5	9	7	1087
2	10	TNIHET	HOM	UM	HIGH	5.5	9	7	683
2	10	TNIHET	HOM	UM	HIGH	5.5	9	6	794
2	10	TNIHET	HOM	UM	HIGH	5.5	9	8	581
2	10	TNIHET	HOM	UM	LOW	22	184	55	6764
2	10	TNIHET	HOM	UM	LOW	22	108	38	4243
2	10	TNIHET	HOM	UM	LOW	22	72	32	3470
2	10	TNIHET	HOM	UM	LOW	22	36	22	2726
2	10	TNIHET	HOM	UM	NO	88	400	156	18419
2	10	TNIHET	HET	M	HIGH	10	46	20	2751
2	10	TNIHET	HET	M	HIGH	10	46	21	2661
2	10	TNIHET	HET	M	HIGH	10	46	15	1583
2	10	TNIHET	HET	M	HIGH	10	46	17	2069
2	10	TNIHET	HET	M	HIGH	6	27	11	938
2	10	TNIHET	HET	M	HIGH	6	27	14	1526
2	10	TNIHET	HET	M	HIGH	6	27	12	980
2	10	TNIHET	HET	M	HIGH	6	27	14	1603
2	10	TNIHET	HET	M	HIGH	4	18	9	1349
2	10	TNIHET	HET	M	HIGH	4	18	9	950
2	10	TNIHET	HET	M	HIGH	4	18	9	1132
2	10	TNIHET	HET	M	HIGH	4	18	9	706
2	10	TNIHET	HET	M	HIGH	2	9	7	559
2	10	TNIHET	HET	M	HIGH	2	9	3	366
2	10	TNIHET	HET	M	HIGH	2	9	7	703
2	10	TNIHET	HET	M	HIGH	2	9	5	273
2	10	TNIHET	HET	M	LOW	40	184	69	5443
2	10	TNIHET	HET	M	LOW	24	108	38	3003
2	10	TNIHET	HET	M	LOW	16	72	29	1253
2	10	TNIHET	HET	M	LOW	8	36	15	988
2	10	TNIHET	HET	M	NO	88	400	178	27025

Appendix B. Mass of some individual survivors in selected fragments. Column headings are defined as follows:

EXPERIMENT: Experiment 1, in which all T. ni are distributed evenly across the landscape, is coded as 1. Experiment 2, in which all T. ni are distributed unevenly among the four quarters of a landscape, is coded as 2.

REP: Experiment 1 was repeated five times, coded 1 through 5; experiment 2 repetitions are coded 6 through 10.

T. NI: TNIHOM indicates that T. ni were distributed homogeneously. TNIHET indicates that T. ni were distributed heterogeneously.

FOOD: HET indicates that food was distributed heterogeneously. HOM indicates homogeneous food distribution.

M/UM: Matched treatments are coded as M, unmatched treatments as UM.

FRAG: Fragmentation levels are HIGH, LOW, or NO (no fragmentation).

INDEX: Fragments in each treatment are indexed by physical position. Fragments in high fragmentation treatments are indexed A through P; fragments in low fragmentation treatments are indexed A through D. Fragments are arranged as follows:

A	C	E	G
B	D	F	H
I	K	M	O
J	L	N	P

High fragmentation treatment

A	C
B	D

Low fragmentation treatment

FOODAMT: The number of units of food in the fragment.

INTRO TNI: The number of T. ni individuals initially introduced into the fragment.

INDMASS: Mass of surviving individual (mg).

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	71
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	200
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	186
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	209
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	156
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	107
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	99
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	208
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	77
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	81
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	50
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	194
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	121
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	167
1	1	TNIHOM	HOM	M	HIGH	A	5.5	25	96
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	57
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	149
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	162
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	201
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	181
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	183
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	156
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	179
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	116
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	67
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	164
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	92
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	104
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	149
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	65
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	76
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	125
1	1	TNIHOM	HOM	M	HIGH	B	5.5	100	86
1	1	TNIHOM	HOM	M	LOW	A	22	100	135
1	1	TNIHOM	HOM	M	LOW	A	22	100	185
1	1	TNIHOM	HOM	M	LOW	A	22	100	163
1	1	TNIHOM	HOM	M	LOW	A	22	100	63
1	1	TNIHOM	HOM	M	LOW	A	22	100	189

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	1	TNIHOM	HOM	M	LOW	A	22	100	85
1	1	TNIHOM	HOM	M	LOW	A	22	100	99
1	1	TNIHOM	HOM	M	LOW	A	22	100	175
1	1	TNIHOM	HOM	M	LOW	A	22	100	138
1	1	TNIHOM	HOM	M	LOW	A	22	100	184
1	1	TNIHOM	HOM	M	LOW	A	22	100	54
1	1	TNIHOM	HOM	M	LOW	A	22	100	64
1	1	TNIHOM	HOM	M	LOW	A	22	100	148
1	1	TNIHOM	HOM	M	LOW	A	22	100	106
1	1	TNIHOM	HOM	M	LOW	A	22	100	79
1	1	TNIHOM	HOM	M	LOW	A	22	100	186
1	1	TNIHOM	HOM	M	LOW	A	22	100	141
1	1	TNIHOM	HOM	M	LOW	A	22	100	204
1	1	TNIHOM	HOM	M	LOW	A	22	100	159
1	1	TNIHOM	HOM	M	LOW	A	22	100	114
1	1	TNIHOM	HOM	M	LOW	A	22	100	137
1	1	TNIHOM	HOM	M	LOW	A	22	100	159
1	1	TNIHOM	HOM	M	LOW	A	22	100	68
1	1	TNIHOM	HOM	M	LOW	A	22	100	77
1	1	TNIHOM	HOM	M	LOW	A	22	100	188
1	1	TNIHOM	HOM	M	NO	A	88	400	202
1	1	TNIHOM	HOM	M	NO	A	88	400	76
1	1	TNIHOM	HOM	M	NO	A	88	400	46
1	1	TNIHOM	HOM	M	NO	A	88	400	137
1	1	TNIHOM	HOM	M	NO	A	88	400	210
1	1	TNIHOM	HOM	M	NO	A	88	400	194
1	1	TNIHOM	HOM	M	NO	A	88	400	119
1	1	TNIHOM	HOM	M	NO	A	88	400	86
1	1	TNIHOM	HOM	M	NO	A	88	400	198
1	1	TNIHOM	HOM	M	NO	A	88	400	234
1	1	TNIHOM	HOM	M	NO	A	88	400	51
1	1	TNIHOM	HOM	M	NO	A	88	400	78
1	1	TNIHOM	HOM	M	NO	A	88	400	145
1	1	TNIHOM	HOM	M	NO	A	88	400	55
1	1	TNIHOM	HOM	M	NO	A	88	400	99
1	1	TNIHOM	HOM	M	NO	A	88	400	67
1	1	TNIHOM	HOM	M	NO	A	88	400	68
1	1	TNIHOM	HOM	M	NO	A	88	400	155
1	1	TNIHOM	HOM	M	NO	A	88	400	170
1	1	TNIHOM	HOM	M	NO	A	88	400	185
1	1	TNIHOM	HET	UM	HIGH	A	2	25	155
1	1	TNIHOM	HET	UM	HIGH	A	2	25	192
1	1	TNIHOM	HET	UM	HIGH	A	2	25	103
1	1	TNIHOM	HET	UM	HIGH	A	2	25	95
1	1	TNIHOM	HET	UM	HIGH	A	2	25	268
1	1	TNIHOM	HET	UM	HIGH	A	2	25	167
1	1	TNIHOM	HET	UM	HIGH	A	2	25	65
1	1	TNIHOM	HET	UM	HIGH	A	2	25	103
1	1	TNIHOM	HET	UM	HIGH	A	2	25	166
1	1	TNIHOM	HET	UM	HIGH	A	2	25	39
1	1	TNIHOM	HET	UM	HIGH	A	2	25	65
1	1	TNIHOM	HET	UM	HIGH	B	2	25	135
1	1	TNIHOM	HET	UM	HIGH	B	2	25	142
1	1	TNIHOM	HET	UM	HIGH	B	2	25	73
1	1	TNIHOM	HET	UM	HIGH	B	2	25	132
1	1	TNIHOM	HET	UM	HIGH	B	2	25	125
1	1	TNIHOM	HET	UM	HIGH	B	2	25	150
1	1	TNIHOM	HET	UM	HIGH	B	2	25	67
1	1	TNIHOM	HET	UM	HIGH	B	2	25	78
1	1	TNIHOM	HET	UM	HIGH	B	2	25	56
1	1	TNIHOM	HET	UM	HIGH	B	2	25	126
1	1	TNIHOM	HET	UM	HIGH	D	2	25	197
1	1	TNIHOM	HET	UM	HIGH	D	2	25	126
1	1	TNIHOM	HET	UM	HIGH	D	2	25	57
1	1	TNIHOM	HET	UM	HIGH	D	2	25	142

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	1	TNIHOM	HET	UM	HIGH	D	2	25	46
1	1	TNIHOM	HET	UM	HIGH	D	2	25	56
1	1	TNIHOM	HET	UM	HIGH	D	2	25	162
1	1	TNIHOM	HET	UM	HIGH	D	2	25	51
1	1	TNIHOM	HET	UM	HIGH	D	2	25	83
1	1	TNIHOM	HET	UM	HIGH	E	4	25	291
1	1	TNIHOM	HET	UM	HIGH	E	4	25	181
1	1	TNIHOM	HET	UM	HIGH	E	4	25	98
1	1	TNIHOM	HET	UM	HIGH	E	4	25	239
1	1	TNIHOM	HET	UM	HIGH	E	4	25	149
1	1	TNIHOM	HET	UM	HIGH	E	4	25	94
1	1	TNIHOM	HET	UM	HIGH	E	4	25	162
1	1	TNIHOM	HET	UM	HIGH	E	4	25	245
1	1	TNIHOM	HET	UM	HIGH	E	4	25	79
1	1	TNIHOM	HET	UM	HIGH	E	4	25	185
1	1	TNIHOM	HET	UM	HIGH	E	4	25	163
1	1	TNIHOM	HET	UM	HIGH	H	4	25	205
1	1	TNIHOM	HET	UM	HIGH	H	4	25	156
1	1	TNIHOM	HET	UM	HIGH	H	4	25	195
1	1	TNIHOM	HET	UM	HIGH	H	4	25	174
1	1	TNIHOM	HET	UM	HIGH	H	4	25	206
1	1	TNIHOM	HET	UM	HIGH	H	4	25	172
1	1	TNIHOM	HET	UM	HIGH	H	4	25	202
1	1	TNIHOM	HET	UM	HIGH	H	4	25	214
1	1	TNIHOM	HET	UM	HIGH	H	4	25	61
1	1	TNIHOM	HET	UM	HIGH	H	4	25	119
1	1	TNIHOM	HET	UM	HIGH	H	4	25	141
1	1	TNIHOM	HET	UM	HIGH	H	4	25	81
1	1	TNIHOM	HET	UM	HIGH	I	6	25	177
1	1	TNIHOM	HET	UM	HIGH	I	6	25	200
1	1	TNIHOM	HET	UM	HIGH	I	6	25	191
1	1	TNIHOM	HET	UM	HIGH	I	6	25	90
1	1	TNIHOM	HET	UM	HIGH	I	6	25	175
1	1	TNIHOM	HET	UM	HIGH	I	6	25	114
1	1	TNIHOM	HET	UM	HIGH	I	6	25	221
1	1	TNIHOM	HET	UM	HIGH	I	6	25	203
1	1	TNIHOM	HET	UM	HIGH	I	6	25	209
1	1	TNIHOM	HET	UM	HIGH	I	6	25	92
1	1	TNIHOM	HET	UM	HIGH	I	6	25	77
1	1	TNIHOM	HET	UM	HIGH	I	6	25	134
1	1	TNIHOM	HET	UM	HIGH	I	6	25	167
1	1	TNIHOM	HET	UM	HIGH	I	6	25	77
1	1	TNIHOM	HET	UM	HIGH	I	6	25	83
1	1	TNIHOM	HET	UM	HIGH	I	6	25	124
1	1	TNIHOM	HET	UM	HIGH	I	6	25	61
1	1	TNIHOM	HET	UM	HIGH	L	6	25	162
1	1	TNIHOM	HET	UM	HIGH	L	6	25	192
1	1	TNIHOM	HET	UM	HIGH	L	6	25	184
1	1	TNIHOM	HET	UM	HIGH	L	6	25	142
1	1	TNIHOM	HET	UM	HIGH	L	6	25	140
1	1	TNIHOM	HET	UM	HIGH	L	6	25	48
1	1	TNIHOM	HET	UM	HIGH	L	6	25	78
1	1	TNIHOM	HET	UM	HIGH	L	6	25	151
1	1	TNIHOM	HET	UM	HIGH	L	6	25	185
1	1	TNIHOM	HET	UM	HIGH	L	6	25	192
1	1	TNIHOM	HET	UM	HIGH	L	6	25	210
1	1	TNIHOM	HET	UM	HIGH	L	6	25	150
1	1	TNIHOM	HET	UM	HIGH	L	6	25	215
1	1	TNIHOM	HET	UM	HIGH	L	6	25	141
1	1	TNIHOM	HET	UM	HIGH	L	6	25	100
1	1	TNIHOM	HET	UM	HIGH	M	10	25	166
1	1	TNIHOM	HET	UM	HIGH	M	10	25	265
1	1	TNIHOM	HET	UM	HIGH	M	10	25	134
1	1	TNIHOM	HET	UM	HIGH	M	10	25	143
1	1	TNIHOM	HET	UM	HIGH	M	10	25	194

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	1	TNIHOM	HET	UM	HIGH	M	10	25	154
1	1	TNIHOM	HET	UM	HIGH	M	10	25	112
1	1	TNIHOM	HET	UM	HIGH	M	10	25	198
1	1	TNIHOM	HET	UM	HIGH	M	10	25	198
1	1	TNIHOM	HET	UM	HIGH	M	10	25	198
1	1	TNIHOM	HET	UM	HIGH	M	10	25	106
1	1	TNIHOM	HET	UM	HIGH	M	10	25	182
1	1	TNIHOM	HET	UM	HIGH	M	10	25	144
1	1	TNIHOM	HET	UM	HIGH	M	10	25	139
1	1	TNIHOM	HET	UM	HIGH	M	10	25	123
1	1	TNIHOM	HET	UM	HIGH	M	10	25	171
1	1	TNIHOM	HET	UM	HIGH	M	10	25	161
1	1	TNIHOM	HET	UM	HIGH	M	10	25	132
1	1	TNIHOM	HET	UM	HIGH	M	10	25	188
1	1	TNIHOM	HET	UM	HIGH	M	10	25	204
1	1	TNIHOM	HET	UM	HIGH	M	10	25	111
1	1	TNIHOM	HET	UM	HIGH	M	10	25	106
1	1	TNIHOM	HET	UM	HIGH	M	10	25	78
1	1	TNIHOM	HET	UM	HIGH	M	10	25	47
1	1	TNIHOM	HET	UM	HIGH	M	10	25	160
1	1	TNIHOM	HET	UM	HIGH	P	10	25	100
1	1	TNIHOM	HET	UM	HIGH	P	10	25	222
1	1	TNIHOM	HET	UM	HIGH	P	10	25	72
1	1	TNIHOM	HET	UM	HIGH	P	10	25	157
1	1	TNIHOM	HET	UM	HIGH	P	10	25	226
1	1	TNIHOM	HET	UM	HIGH	P	10	25	139
1	1	TNIHOM	HET	UM	HIGH	P	10	25	143
1	1	TNIHOM	HET	UM	HIGH	P	10	25	226
1	1	TNIHOM	HET	UM	HIGH	P	10	25	94
1	1	TNIHOM	HET	UM	HIGH	P	10	25	239
1	1	TNIHOM	HET	UM	HIGH	P	10	25	123
1	1	TNIHOM	HET	UM	HIGH	P	10	25	58
1	1	TNIHOM	HET	UM	HIGH	P	10	25	107
1	1	TNIHOM	HET	UM	HIGH	P	10	25	171
1	1	TNIHOM	HET	UM	HIGH	P	10	25	89
1	1	TNIHOM	HET	UM	HIGH	P	10	25	96
1	1	TNIHOM	HET	UM	HIGH	P	10	25	130
1	1	TNIHOM	HET	UM	HIGH	P	10	25	168
1	1	TNIHOM	HET	UM	HIGH	P	10	25	51
1	1	TNIHOM	HET	UM	HIGH	P	10	25	37
1	1	TNIHOM	HET	UM	LOW	A	8	100	204
1	1	TNIHOM	HET	UM	LOW	A	8	100	150
1	1	TNIHOM	HET	UM	LOW	A	8	100	100
1	1	TNIHOM	HET	UM	LOW	A	8	100	184
1	1	TNIHOM	HET	UM	LOW	A	8	100	106
1	1	TNIHOM	HET	UM	LOW	A	8	100	162
1	1	TNIHOM	HET	UM	LOW	A	8	100	162
1	1	TNIHOM	HET	UM	LOW	A	8	100	161
1	1	TNIHOM	HET	UM	LOW	A	8	100	59
1	1	TNIHOM	HET	UM	LOW	A	8	100	73
1	1	TNIHOM	HET	UM	LOW	A	8	100	69
1	1	TNIHOM	HET	UM	LOW	A	8	100	16
1	1	TNIHOM	HET	UM	LOW	A	8	100	74
1	1	TNIHOM	HET	UM	LOW	A	8	100	137
1	1	TNIHOM	HET	UM	LOW	A	8	100	199
1	1	TNIHOM	HET	UM	LOW	A	8	100	102
1	1	TNIHOM	HET	UM	LOW	A	8	100	127
1	1	TNIHOM	HET	UM	LOW	A	8	100	68
1	1	TNIHOM	HET	UM	LOW	A	8	100	149
1	1	TNIHOM	HET	UM	LOW	A	8	100	58
1	1	TNIHOM	HET	UM	LOW	B	16	100	170
1	1	TNIHOM	HET	UM	LOW	B	16	100	131
1	1	TNIHOM	HET	UM	LOW	B	16	100	136
1	1	TNIHOM	HET	UM	LOW	B	16	100	203
1	1	TNIHOM	HET	UM	LOW	B	16	100	126

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	1	TNIHOM	HET	UM	LOW	B	16	100	126
1	1	TNIHOM	HET	UM	LOW	B	16	100	161
1	1	TNIHOM	HET	UM	LOW	B	16	100	180
1	1	TNIHOM	HET	UM	LOW	B	16	100	86
1	1	TNIHOM	HET	UM	LOW	B	16	100	95
1	1	TNIHOM	HET	UM	LOW	B	16	100	201
1	1	TNIHOM	HET	UM	LOW	B	16	100	195
1	1	TNIHOM	HET	UM	LOW	B	16	100	123
1	1	TNIHOM	HET	UM	LOW	B	16	100	115
1	1	TNIHOM	HET	UM	LOW	B	16	100	129
1	1	TNIHOM	HET	UM	LOW	B	16	100	156
1	1	TNIHOM	HET	UM	LOW	B	16	100	162
1	1	TNIHOM	HET	UM	LOW	B	16	100	65
1	1	TNIHOM	HET	UM	LOW	B	16	100	45
1	1	TNIHOM	HET	UM	LOW	B	16	100	43
1	1	TNIHOM	HET	UM	LOW	C	24	100	123
1	1	TNIHOM	HET	UM	LOW	C	24	100	212
1	1	TNIHOM	HET	UM	LOW	C	24	100	239
1	1	TNIHOM	HET	UM	LOW	C	24	100	229
1	1	TNIHOM	HET	UM	LOW	C	24	100	222
1	1	TNIHOM	HET	UM	LOW	C	24	100	215
1	1	TNIHOM	HET	UM	LOW	C	24	100	150
1	1	TNIHOM	HET	UM	LOW	C	24	100	190
1	1	TNIHOM	HET	UM	LOW	C	24	100	144
1	1	TNIHOM	HET	UM	LOW	C	24	100	66
1	1	TNIHOM	HET	UM	LOW	C	24	100	105
1	1	TNIHOM	HET	UM	LOW	C	24	100	198
1	1	TNIHOM	HET	UM	LOW	C	24	100	74
1	1	TNIHOM	HET	UM	LOW	C	24	100	191
1	1	TNIHOM	HET	UM	LOW	C	24	100	225
1	1	TNIHOM	HET	UM	LOW	C	24	100	121
1	1	TNIHOM	HET	UM	LOW	C	24	100	168
1	1	TNIHOM	HET	UM	LOW	C	24	100	47
1	1	TNIHOM	HET	UM	LOW	C	24	100	71
1	1	TNIHOM	HET	UM	LOW	C	24	100	41
1	1	TNIHOM	HET	UM	LOW	D	40	100	222
1	1	TNIHOM	HET	UM	LOW	D	40	100	220
1	1	TNIHOM	HET	UM	LOW	D	40	100	184
1	1	TNIHOM	HET	UM	LOW	D	40	100	123
1	1	TNIHOM	HET	UM	LOW	D	40	100	132
1	1	TNIHOM	HET	UM	LOW	D	40	100	163
1	1	TNIHOM	HET	UM	LOW	D	40	100	128
1	1	TNIHOM	HET	UM	LOW	D	40	100	60
1	1	TNIHOM	HET	UM	LOW	D	40	100	214
1	1	TNIHOM	HET	UM	LOW	D	40	100	237
1	1	TNIHOM	HET	UM	LOW	D	40	100	217
1	1	TNIHOM	HET	UM	LOW	D	40	100	108
1	1	TNIHOM	HET	UM	LOW	D	40	100	129
1	1	TNIHOM	HET	UM	LOW	D	40	100	181
1	1	TNIHOM	HET	UM	LOW	D	40	100	146
1	1	TNIHOM	HET	UM	LOW	D	40	100	127
1	1	TNIHOM	HET	UM	LOW	D	40	100	149
1	1	TNIHOM	HET	UM	LOW	D	40	100	89
1	1	TNIHOM	HET	UM	LOW	D	40	100	103
1	1	TNIHOM	HET	UM	LOW	D	40	100	168
1	1	TNIHOM	HET	UM	NO	A	88	400	207
1	1	TNIHOM	HET	UM	NO	A	88	400	102
1	1	TNIHOM	HET	UM	NO	A	88	400	188
1	1	TNIHOM	HET	UM	NO	A	88	400	186
1	1	TNIHOM	HET	UM	NO	A	88	400	230
1	1	TNIHOM	HET	UM	NO	A	88	400	119
1	1	TNIHOM	HET	UM	NO	A	88	400	112
1	1	TNIHOM	HET	UM	NO	A	88	400	124
1	1	TNIHOM	HET	UM	NO	A	88	400	195
1	1	TNIHOM	HET	UM	NO	A	88	400	96

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	1	TNIHOM	HET	UM	NO	A	88	400	213
1	1	TNIHOM	HET	UM	NO	A	88	400	129
1	1	TNIHOM	HET	UM	NO	A	88	400	288
1	1	TNIHOM	HET	UM	NO	A	88	400	55
1	1	TNIHOM	HET	UM	NO	A	88	400	186
1	1	TNIHOM	HET	UM	NO	A	88	400	160
1	1	TNIHOM	HET	UM	NO	A	88	400	77
1	1	TNIHOM	HET	UM	NO	A	88	400	196
1	1	TNIHOM	HET	UM	NO	A	88	400	55
1	1	TNIHOM	HET	UM	NO	A	88	400	108
1	1	TNIHOM	HET	UM	NO	A	88	400	249
1	1	TNIHOM	HET	UM	NO	A	88	400	178
1	1	TNIHOM	HET	UM	NO	A	88	400	173
1	1	TNIHOM	HET	UM	NO	A	88	400	194
1	1	TNIHOM	HET	UM	NO	A	88	400	178
1	1	TNIHOM	HET	UM	NO	A	88	400	155
1	1	TNIHOM	HET	UM	NO	A	88	400	92
1	1	TNIHOM	HET	UM	NO	A	88	400	226
1	1	TNIHOM	HET	UM	NO	A	88	400	216
1	1	TNIHOM	HET	UM	NO	A	88	400	103
1	1	TNIHOM	HET	UM	NO	A	88	400	193
1	1	TNIHOM	HET	UM	NO	A	88	400	192
1	1	TNIHOM	HET	UM	NO	A	88	400	206
1	1	TNIHOM	HET	UM	NO	A	88	400	70
1	1	TNIHOM	HET	UM	NO	A	88	400	200
1	1	TNIHOM	HET	UM	NO	A	88	400	32
1	1	TNIHOM	HET	UM	NO	A	88	400	218
1	1	TNIHOM	HET	UM	NO	A	88	400	100
1	1	TNIHOM	HET	UM	NO	A	88	400	67
1	1	TNIHOM	HET	UM	NO	A	88	400	165
1	2	TNIHOM	HET	UM	HIGH	D	2	25	86
1	2	TNIHOM	HET	UM	HIGH	D	2	25	210
1	2	TNIHOM	HET	UM	HIGH	D	2	25	99
1	2	TNIHOM	HET	UM	HIGH	D	2	25	157
1	2	TNIHOM	HET	UM	HIGH	D	2	25	100
1	2	TNIHOM	HET	UM	HIGH	D	2	25	144
1	2	TNIHOM	HET	UM	HIGH	D	2	25	26
1	2	TNIHOM	HET	UM	HIGH	H	4	25	192
1	2	TNIHOM	HET	UM	HIGH	H	4	25	162
1	2	TNIHOM	HET	UM	HIGH	H	4	25	156
1	2	TNIHOM	HET	UM	HIGH	H	4	25	151
1	2	TNIHOM	HET	UM	HIGH	H	4	25	112
1	2	TNIHOM	HET	UM	HIGH	H	4	25	200
1	2	TNIHOM	HET	UM	HIGH	H	4	25	137
1	2	TNIHOM	HET	UM	HIGH	H	4	25	172
1	2	TNIHOM	HET	UM	HIGH	H	4	25	158
1	2	TNIHOM	HET	UM	HIGH	H	4	25	171
1	2	TNIHOM	HET	UM	HIGH	L	6	25	181
1	2	TNIHOM	HET	UM	HIGH	L	6	25	124
1	2	TNIHOM	HET	UM	HIGH	L	6	25	176
1	2	TNIHOM	HET	UM	HIGH	L	6	25	235
1	2	TNIHOM	HET	UM	HIGH	L	6	25	161
1	2	TNIHOM	HET	UM	HIGH	L	6	25	206
1	2	TNIHOM	HET	UM	HIGH	L	6	25	69
1	2	TNIHOM	HET	UM	HIGH	L	6	25	113
1	2	TNIHOM	HET	UM	HIGH	L	6	25	185
1	2	TNIHOM	HET	UM	HIGH	L	6	25	184
1	2	TNIHOM	HET	UM	HIGH	L	6	25	225
1	2	TNIHOM	HET	UM	HIGH	L	6	25	94
1	2	TNIHOM	HET	UM	HIGH	L	6	25	159
1	2	TNIHOM	HET	UM	HIGH	L	6	25	138
1	2	TNIHOM	HET	UM	HIGH	P	10	25	170
1	2	TNIHOM	HET	UM	HIGH	P	10	25	157
1	2	TNIHOM	HET	UM	HIGH	P	10	25	165
1	2	TNIHOM	HET	UM	HIGH	P	10	25	164

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	2	TNIHOM	HET	UM	HIGH	P	10	25	231
1	2	TNIHOM	HET	UM	HIGH	P	10	25	195
1	2	TNIHOM	HET	UM	HIGH	P	10	25	156
1	2	TNIHOM	HET	UM	HIGH	P	10	25	142
1	2	TNIHOM	HET	UM	HIGH	P	10	25	102
1	2	TNIHOM	HET	UM	HIGH	P	10	25	109
1	2	TNIHOM	HET	UM	HIGH	P	10	25	166
1	2	TNIHOM	HET	UM	HIGH	P	10	25	218
1	2	TNIHOM	HET	UM	HIGH	P	10	25	186
1	2	TNIHOM	HET	UM	LOW	A	8	100	122
1	2	TNIHOM	HET	UM	LOW	A	8	100	153
1	2	TNIHOM	HET	UM	LOW	A	8	100	118
1	2	TNIHOM	HET	UM	LOW	A	8	100	143
1	2	TNIHOM	HET	UM	LOW	A	8	100	166
1	2	TNIHOM	HET	UM	LOW	A	8	100	78
1	2	TNIHOM	HET	UM	LOW	A	8	100	106
1	2	TNIHOM	HET	UM	LOW	A	8	100	83
1	2	TNIHOM	HET	UM	LOW	B	16	100	143
1	2	TNIHOM	HET	UM	LOW	B	16	100	14
1	2	TNIHOM	HET	UM	LOW	B	16	100	160
1	2	TNIHOM	HET	UM	LOW	B	16	100	164
1	2	TNIHOM	HET	UM	LOW	B	16	100	164
1	2	TNIHOM	HET	UM	LOW	B	16	100	100
1	2	TNIHOM	HET	UM	LOW	B	16	100	206
1	2	TNIHOM	HET	UM	LOW	B	16	100	80
1	2	TNIHOM	HET	UM	LOW	C	24	100	131
1	2	TNIHOM	HET	UM	LOW	C	24	100	135
1	2	TNIHOM	HET	UM	LOW	C	24	100	126
1	2	TNIHOM	HET	UM	LOW	C	24	100	200
1	2	TNIHOM	HET	UM	LOW	C	24	100	240
1	2	TNIHOM	HET	UM	LOW	C	24	100	51
1	2	TNIHOM	HET	UM	LOW	C	24	100	200
1	2	TNIHOM	HET	UM	LOW	C	24	100	155
1	2	TNIHOM	HET	UM	LOW	D	40	100	92
1	2	TNIHOM	HET	UM	LOW	D	40	100	64
1	2	TNIHOM	HET	UM	LOW	D	40	100	156
1	2	TNIHOM	HET	UM	LOW	D	40	100	237
1	2	TNIHOM	HET	UM	LOW	D	40	100	151
1	2	TNIHOM	HET	UM	LOW	D	40	100	223
1	2	TNIHOM	HET	UM	LOW	D	40	100	160
1	2	TNIHOM	HET	UM	LOW	D	40	100	194
1	2	TNIHOM	HET	UM	NO	A	88	400	151
1	2	TNIHOM	HET	UM	NO	A	88	400	234
1	2	TNIHOM	HET	UM	NO	A	88	400	74
1	2	TNIHOM	HET	UM	NO	A	88	400	154
1	2	TNIHOM	HET	UM	NO	A	88	400	74
1	2	TNIHOM	HET	UM	NO	A	88	400	62
1	2	TNIHOM	HET	UM	NO	A	88	400	173
1	2	TNIHOM	HET	UM	NO	A	88	400	63
1	2	TNIHOM	HET	UM	NO	A	88	400	112
1	2	TNIHOM	HET	UM	NO	A	88	400	137
1	2	TNIHOM	HET	UM	NO	A	88	400	184
1	2	TNIHOM	HET	UM	NO	A	88	400	146
1	2	TNIHOM	HET	UM	NO	A	88	400	154
1	2	TNIHOM	HET	UM	NO	A	88	400	89
1	2	TNIHOM	HET	UM	NO	A	88	400	206
1	2	TNIHOM	HET	UM	NO	A	88	400	132
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	122
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	174
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	130
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	132
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	214
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	131
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	173

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	171
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	99
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	112
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	196
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	175
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	97
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	118
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	106
1	2	TNIHOM	HOM	M	HIGH	D	5.5	25	100
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	167
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	144
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	151
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	143
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	78
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	146
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	170
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	191
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	149
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	126
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	190
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	170
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	170
1	2	TNIHOM	HOM	M	HIGH	P	5.5	25	136
1	2	TNIHOM	HOM	M	LOW	A	22	100	101
1	2	TNIHOM	HOM	M	LOW	A	22	100	68
1	2	TNIHOM	HOM	M	LOW	A	22	100	151
1	2	TNIHOM	HOM	M	LOW	A	22	100	162
1	2	TNIHOM	HOM	M	LOW	A	22	100	126
1	2	TNIHOM	HOM	M	LOW	A	22	100	107
1	2	TNIHOM	HOM	M	LOW	A	22	100	201
1	2	TNIHOM	HOM	M	LOW	A	22	100	136
1	2	TNIHOM	HOM	M	LOW	D	22	100	174
1	2	TNIHOM	HOM	M	LOW	D	22	100	102
1	2	TNIHOM	HOM	M	LOW	D	22	100	84
1	2	TNIHOM	HOM	M	LOW	D	22	100	245
1	2	TNIHOM	HOM	M	LOW	D	22	100	162
1	2	TNIHOM	HOM	M	LOW	D	22	100	200
1	2	TNIHOM	HOM	M	LOW	D	22	100	122
1	2	TNIHOM	HOM	M	LOW	D	22	100	213
1	2	TNIHOM	HOM	M	NO	A	88	400	206
1	2	TNIHOM	HOM	M	NO	A	88	400	85
1	2	TNIHOM	HOM	M	NO	A	88	400	99
1	2	TNIHOM	HOM	M	NO	A	88	400	99
1	2	TNIHOM	HOM	M	NO	A	88	400	195
1	2	TNIHOM	HOM	M	NO	A	88	400	239
1	2	TNIHOM	HOM	M	NO	A	88	400	51
1	2	TNIHOM	HOM	M	NO	A	88	400	199
1	2	TNIHOM	HOM	M	NO	A	88	400	230
1	2	TNIHOM	HOM	M	NO	A	88	400	126
1	2	TNIHOM	HOM	M	NO	A	88	400	154
1	2	TNIHOM	HOM	M	NO	A	88	400	137
1	2	TNIHOM	HOM	M	NO	A	88	400	142
1	2	TNIHOM	HOM	M	NO	A	88	400	213
1	2	TNIHOM	HOM	M	NO	A	88	400	156
1	2	TNIHOM	HOM	M	NO	A	88	400	132
1	3	TNIHOM	HET	UM	HIGH	A	2	25	191
1	3	TNIHOM	HET	UM	HIGH	A	2	25	221
1	3	TNIHOM	HET	UM	HIGH	A	2	25	227
1	3	TNIHOM	HET	UM	HIGH	A	2	25	127
1	3	TNIHOM	HET	UM	HIGH	A	2	25	70
1	3	TNIHOM	HET	UM	HIGH	A	2	25	200
1	3	TNIHOM	HET	UM	HIGH	A	2	25	107
1	3	TNIHOM	HET	UM	HIGH	A	2	25	139
1	3	TNIHOM	HET	UM	HIGH	A	2	25	60

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	3	TNIHOM	HET	UM	HIGH	A	2	25	57
1	3	TNIHOM	HET	UM	HIGH	H	4	25	207
1	3	TNIHOM	HET	UM	HIGH	H	4	25	153
1	3	TNIHOM	HET	UM	HIGH	H	4	25	185
1	3	TNIHOM	HET	UM	HIGH	H	4	25	234
1	3	TNIHOM	HET	UM	HIGH	H	4	25	42
1	3	TNIHOM	HET	UM	HIGH	H	4	25	93
1	3	TNIHOM	HET	UM	HIGH	H	4	25	226
1	3	TNIHOM	HET	UM	HIGH	H	4	25	201
1	3	TNIHOM	HET	UM	HIGH	H	4	25	244
1	3	TNIHOM	HET	UM	HIGH	H	4	25	125
1	3	TNIHOM	HET	UM	HIGH	H	4	25	50
1	3	TNIHOM	HET	UM	HIGH	H	4	25	196
1	3	TNIHOM	HET	UM	HIGH	H	4	25	188
1	3	TNIHOM	HET	UM	HIGH	H	4	25	144
1	3	TNIHOM	HET	UM	HIGH	L	6	25	200
1	3	TNIHOM	HET	UM	HIGH	L	6	25	217
1	3	TNIHOM	HET	UM	HIGH	L	6	25	150
1	3	TNIHOM	HET	UM	HIGH	L	6	25	157
1	3	TNIHOM	HET	UM	HIGH	L	6	25	164
1	3	TNIHOM	HET	UM	HIGH	L	6	25	233
1	3	TNIHOM	HET	UM	HIGH	L	6	25	91
1	3	TNIHOM	HET	UM	HIGH	L	6	25	246
1	3	TNIHOM	HET	UM	HIGH	L	6	25	168
1	3	TNIHOM	HET	UM	HIGH	L	6	25	136
1	3	TNIHOM	HET	UM	HIGH	L	6	25	148
1	3	TNIHOM	HET	UM	HIGH	L	6	25	253
1	3	TNIHOM	HET	UM	HIGH	L	6	25	234
1	3	TNIHOM	HET	UM	HIGH	L	6	25	159
1	3	TNIHOM	HET	UM	HIGH	L	6	25	63
1	3	TNIHOM	HET	UM	HIGH	L	6	25	256
1	3	TNIHOM	HET	UM	HIGH	L	6	25	107
1	3	TNIHOM	HET	UM	HIGH	L	6	25	189
1	3	TNIHOM	HET	UM	HIGH	L	6	25	65
1	3	TNIHOM	HET	UM	HIGH	L	6	25	159
1	3	TNIHOM	HET	UM	HIGH	L	6	25	156
1	3	TNIHOM	HET	UM	HIGH	L	6	25	131
1	3	TNIHOM	HET	UM	HIGH	L	6	25	137
1	3	TNIHOM	HET	UM	HIGH	L	6	25	235
1	3	TNIHOM	HET	UM	HIGH	P	10	25	239
1	3	TNIHOM	HET	UM	HIGH	P	10	25	213
1	3	TNIHOM	HET	UM	HIGH	P	10	25	219
1	3	TNIHOM	HET	UM	HIGH	P	10	25	190
1	3	TNIHOM	HET	UM	HIGH	P	10	25	156
1	3	TNIHOM	HET	UM	HIGH	P	10	25	221
1	3	TNIHOM	HET	UM	HIGH	P	10	25	318
1	3	TNIHOM	HET	UM	HIGH	P	10	25	109
1	3	TNIHOM	HET	UM	HIGH	P	10	25	277
1	3	TNIHOM	HET	UM	HIGH	P	10	25	245
1	3	TNIHOM	HET	UM	HIGH	P	10	25	264
1	3	TNIHOM	HET	UM	HIGH	P	10	25	158
1	3	TNIHOM	HET	UM	HIGH	P	10	25	318
1	3	TNIHOM	HET	UM	HIGH	P	10	25	188
1	3	TNIHOM	HET	UM	HIGH	P	10	25	87
1	3	TNIHOM	HET	UM	HIGH	P	10	25	281
1	3	TNIHOM	HET	UM	HIGH	P	10	25	237
1	3	TNIHOM	HET	UM	HIGH	P	10	25	276
1	3	TNIHOM	HET	UM	HIGH	P	10	25	279
1	3	TNIHOM	HET	UM	HIGH	P	10	25	273
1	3	TNIHOM	HET	UM	HIGH	P	10	25	251
1	3	TNIHOM	HET	UM	HIGH	P	10	25	272
1	3	TNIHOM	HET	UM	HIGH	P	10	25	276
1	3	TNIHOM	HET	UM	HIGH	P	10	25	288
1	3	TNIHOM	HET	UM	LOW	A	8	100	68
1	3	TNIHOM	HET	UM	LOW	A	8	100	88

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	3	TNIHOM	HET	UM	LOW	A	8	100	109
1	3	TNIHOM	HET	UM	LOW	A	8	100	142
1	3	TNIHOM	HET	UM	LOW	A	8	100	225
1	3	TNIHOM	HET	UM	LOW	A	8	100	72
1	3	TNIHOM	HET	UM	LOW	B	16	100	215
1	3	TNIHOM	HET	UM	LOW	B	16	100	48
1	3	TNIHOM	HET	UM	LOW	B	16	100	160
1	3	TNIHOM	HET	UM	LOW	B	16	100	265
1	3	TNIHOM	HET	UM	LOW	B	16	100	80
1	3	TNIHOM	HET	UM	LOW	B	16	100	186
1	3	TNIHOM	HET	UM	LOW	C	24	100	273
1	3	TNIHOM	HET	UM	LOW	C	24	100	228
1	3	TNIHOM	HET	UM	LOW	C	24	100	232
1	3	TNIHOM	HET	UM	LOW	C	24	100	208
1	3	TNIHOM	HET	UM	LOW	C	24	100	75
1	3	TNIHOM	HET	UM	LOW	C	24	100	278
1	3	TNIHOM	HET	UM	LOW	D	40	100	270
1	3	TNIHOM	HET	UM	LOW	D	40	100	130
1	3	TNIHOM	HET	UM	LOW	D	40	100	345
1	3	TNIHOM	HET	UM	LOW	D	40	100	268
1	3	TNIHOM	HET	UM	LOW	D	40	100	226
1	3	TNIHOM	HET	UM	LOW	D	40	100	101
1	3	TNIHOM	HET	UM	NO	D	88	400	86
1	3	TNIHOM	HET	UM	NO	D	88	400	256
1	3	TNIHOM	HET	UM	NO	D	88	400	321
1	3	TNIHOM	HET	UM	NO	D	88	400	52
1	3	TNIHOM	HET	UM	NO	D	88	400	268
1	3	TNIHOM	HET	UM	NO	D	88	400	311
1	3	TNIHOM	HET	UM	NO	D	88	400	210
1	3	TNIHOM	HET	UM	NO	D	88	400	48
1	3	TNIHOM	HET	UM	NO	D	88	400	204
1	3	TNIHOM	HET	UM	NO	D	88	400	128
1	3	TNIHOM	HET	UM	NO	D	88	400	137
1	3	TNIHOM	HET	UM	NO	D	88	400	341
1	3	TNIHOM	HET	UM	NO	D	88	400	242
1	3	TNIHOM	HET	UM	NO	D	88	400	138
1	3	TNIHOM	HET	UM	NO	D	88	400	120
1	3	TNIHOM	HET	UM	NO	D	88	400	266
1	3	TNIHOM	HET	UM	NO	D	88	400	149
1	3	TNIHOM	HET	UM	NO	D	88	400	264
1	3	TNIHOM	HET	UM	NO	D	88	400	236
1	3	TNIHOM	HET	UM	NO	D	88	400	284
1	3	TNIHOM	HET	UM	NO	D	88	400	271
1	3	TNIHOM	HET	UM	NO	D	88	400	280
1	3	TNIHOM	HET	UM	NO	D	88	400	243
1	3	TNIHOM	HET	UM	NO	D	88	400	222
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	174
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	216
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	181
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	73
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	256
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	232
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	150
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	44
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	233
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	254
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	186
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	102
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	157
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	145
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	101
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	41
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	230
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	228
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	67

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	158
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	230
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	191
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	82
1	3	TNIHOM	HOM	M	HIGH	A	5.5	25	156
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	300
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	171
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	296
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	158
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	280
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	290
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	195
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	292
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	106
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	154
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	32
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	189
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	313
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	259
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	288
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	65
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	283
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	298
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	114
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	54
1	3	TNIHOM	HOM	M	HIGH	E	5.5	25	266
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	284
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	159
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	128
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	120
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	78
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	18
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	129
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	123
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	178
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	252
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	17
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	275
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	80
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	233
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	75
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	173
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	62
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	106
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	232
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	150
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	242
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	196
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	314
1	3	TNIHOM	HOM	M	HIGH	I	5.5	25	244
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	198
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	147
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	245
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	22
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	231
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	32
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	136
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	50
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	105
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	233
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	60
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	266
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	141
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	111
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	254

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	242
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	150
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	205
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	10
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	209
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	13
1	3	TNIHOM	HOM	M	HIGH	M	5.5	25	223
1	3	TNIHOM	HOM	M	LOW	A	22	100	206
1	3	TNIHOM	HOM	M	LOW	A	22	100	25
1	3	TNIHOM	HOM	M	LOW	A	22	100	44
1	3	TNIHOM	HOM	M	LOW	A	22	100	252
1	3	TNIHOM	HOM	M	LOW	A	22	100	151
1	3	TNIHOM	HOM	M	LOW	A	22	100	120
1	3	TNIHOM	HOM	M	LOW	B	22	100	180
1	3	TNIHOM	HOM	M	LOW	B	22	100	112
1	3	TNIHOM	HOM	M	LOW	B	22	100	98
1	3	TNIHOM	HOM	M	LOW	B	22	100	285
1	3	TNIHOM	HOM	M	LOW	B	22	100	274
1	3	TNIHOM	HOM	M	LOW	B	22	100	336
1	3	TNIHOM	HOM	M	LOW	C	22	100	237
1	3	TNIHOM	HOM	M	LOW	C	22	100	274
1	3	TNIHOM	HOM	M	LOW	C	22	100	224
1	3	TNIHOM	HOM	M	LOW	C	22	100	251
1	3	TNIHOM	HOM	M	LOW	C	22	100	120
1	3	TNIHOM	HOM	M	LOW	C	22	100	208
1	3	TNIHOM	HOM	M	LOW	D	22	100	11
1	3	TNIHOM	HOM	M	LOW	D	22	100	151
1	3	TNIHOM	HOM	M	LOW	D	22	100	61
1	3	TNIHOM	HOM	M	LOW	D	22	100	224
1	3	TNIHOM	HOM	M	LOW	D	22	100	179
1	3	TNIHOM	HOM	M	LOW	D	22	100	77
1	3	TNIHOM	HOM	M	NO	D	88	400	275
1	3	TNIHOM	HOM	M	NO	D	88	400	205
1	3	TNIHOM	HOM	M	NO	D	88	400	225
1	3	TNIHOM	HOM	M	NO	D	88	400	260
1	3	TNIHOM	HOM	M	NO	D	88	400	160
1	3	TNIHOM	HOM	M	NO	D	88	400	88
1	3	TNIHOM	HOM	M	NO	D	88	400	83
1	3	TNIHOM	HOM	M	NO	D	88	400	148
1	3	TNIHOM	HOM	M	NO	D	88	400	221
1	3	TNIHOM	HOM	M	NO	D	88	400	38
1	3	TNIHOM	HOM	M	NO	D	88	400	175
1	3	TNIHOM	HOM	M	NO	D	88	400	279
1	3	TNIHOM	HOM	M	NO	D	88	400	288
1	3	TNIHOM	HOM	M	NO	D	88	400	266
1	3	TNIHOM	HOM	M	NO	D	88	400	309
1	3	TNIHOM	HOM	M	NO	D	88	400	197
1	3	TNIHOM	HOM	M	NO	D	88	400	330
1	3	TNIHOM	HOM	M	NO	D	88	400	240
1	3	TNIHOM	HOM	M	NO	D	88	400	85
1	3	TNIHOM	HOM	M	NO	D	88	400	256
1	3	TNIHOM	HOM	M	NO	D	88	400	299
1	3	TNIHOM	HOM	M	NO	D	88	400	163
1	3	TNIHOM	HOM	M	NO	D	88	400	197
1	3	TNIHOM	HOM	M	NO	D	88	400	273
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	66
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	233
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	196
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	197
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	149
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	117
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	157
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	185
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	188

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	167
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	206
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	200
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	166
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	205
1	5	TNIHOM	HOM	M	HIGH	A	5.5	25	227
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	224
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	191
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	194
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	93
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	231
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	177
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	150
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	155
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	140
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	145
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	114
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	196
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	167
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	153
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	144
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	209
1	5	TNIHOM	HOM	M	HIGH	E	5.5	25	169
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	190
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	164
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	146
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	46
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	186
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	208
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	206
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	233
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	146
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	143
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	237
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	250
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	152
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	197
1	5	TNIHOM	HOM	M	HIGH	I	5.5	25	266
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	188
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	228
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	180
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	186
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	145
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	229
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	119
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	233
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	116
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	220
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	235
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	43
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	129
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	226
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	88
1	5	TNIHOM	HOM	M	HIGH	M	5.5	25	218
1	5	TNIHOM	HOM	M	LOW	A	22	100	74
1	5	TNIHOM	HOM	M	LOW	A	22	100	192
1	5	TNIHOM	HOM	M	LOW	A	22	100	249
1	5	TNIHOM	HOM	M	LOW	A	22	100	188
1	5	TNIHOM	HOM	M	LOW	A	22	100	197
1	5	TNIHOM	HOM	M	LOW	A	22	100	205
1	5	TNIHOM	HOM	M	LOW	A	22	100	238
1	5	TNIHOM	HOM	M	LOW	A	22	100	196
1	5	TNIHOM	HOM	M	LOW	A	22	100	133
1	5	TNIHOM	HOM	M	LOW	A	22	100	100
1	5	TNIHOM	HOM	M	LOW	B	22	100	199

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	5	TNIHOM	HOM	M	LOW	B	22	100	190
1	5	TNIHOM	HOM	M	LOW	B	22	100	237
1	5	TNIHOM	HOM	M	LOW	B	22	100	186
1	5	TNIHOM	HOM	M	LOW	B	22	100	123
1	5	TNIHOM	HOM	M	LOW	B	22	100	175
1	5	TNIHOM	HOM	M	LOW	B	22	100	172
1	5	TNIHOM	HOM	M	LOW	B	22	100	224
1	5	TNIHOM	HOM	M	LOW	B	22	100	217
1	5	TNIHOM	HOM	M	LOW	B	22	100	187
1	5	TNIHOM	HOM	M	LOW	C	22	100	271
1	5	TNIHOM	HOM	M	LOW	C	22	100	245
1	5	TNIHOM	HOM	M	LOW	C	22	100	200
1	5	TNIHOM	HOM	M	LOW	C	22	100	223
1	5	TNIHOM	HOM	M	LOW	C	22	100	201
1	5	TNIHOM	HOM	M	LOW	C	22	100	231
1	5	TNIHOM	HOM	M	LOW	C	22	100	262
1	5	TNIHOM	HOM	M	LOW	C	22	100	205
1	5	TNIHOM	HOM	M	LOW	C	22	100	182
1	5	TNIHOM	HOM	M	LOW	C	22	100	218
1	5	TNIHOM	HOM	M	LOW	D	22	100	217
1	5	TNIHOM	HOM	M	LOW	D	22	100	216
1	5	TNIHOM	HOM	M	LOW	D	22	100	250
1	5	TNIHOM	HOM	M	LOW	D	22	100	239
1	5	TNIHOM	HOM	M	LOW	D	22	100	204
1	5	TNIHOM	HOM	M	LOW	D	22	100	202
1	5	TNIHOM	HOM	M	LOW	D	22	100	268
1	5	TNIHOM	HOM	M	LOW	D	22	100	66
1	5	TNIHOM	HOM	M	LOW	D	22	100	208
1	5	TNIHOM	HOM	M	LOW	D	22	100	159
1	5	TNIHOM	HOM	M	NO	A	88	400	224
1	5	TNIHOM	HOM	M	NO	A	88	400	244
1	5	TNIHOM	HOM	M	NO	A	88	400	211
1	5	TNIHOM	HOM	M	NO	A	88	400	235
1	5	TNIHOM	HOM	M	NO	A	88	400	248
1	5	TNIHOM	HOM	M	NO	A	88	400	83
1	5	TNIHOM	HOM	M	NO	A	88	400	153
1	5	TNIHOM	HOM	M	NO	A	88	400	186
1	5	TNIHOM	HOM	M	NO	A	88	400	223
1	5	TNIHOM	HOM	M	NO	A	88	400	161
1	5	TNIHOM	HOM	M	NO	A	88	400	166
1	5	TNIHOM	HOM	M	NO	A	88	400	181
1	5	TNIHOM	HOM	M	NO	A	88	400	215
1	5	TNIHOM	HOM	M	NO	A	88	400	211
1	5	TNIHOM	HOM	M	NO	A	88	400	249
1	5	TNIHOM	HOM	M	NO	A	88	400	166
1	5	TNIHOM	HOM	M	NO	A	88	400	174
1	5	TNIHOM	HOM	M	NO	A	88	400	190
1	5	TNIHOM	HOM	M	NO	A	88	400	193
1	5	TNIHOM	HOM	M	NO	A	88	400	151
1	5	TNIHOM	HET	UM	HIGH	A	2	25	192
1	5	TNIHOM	HET	UM	HIGH	A	2	25	119
1	5	TNIHOM	HET	UM	HIGH	A	2	25	195
1	5	TNIHOM	HET	UM	HIGH	A	2	25	128
1	5	TNIHOM	HET	UM	HIGH	A	2	25	159
1	5	TNIHOM	HET	UM	HIGH	A	2	25	192
1	5	TNIHOM	HET	UM	HIGH	A	2	25	238
1	5	TNIHOM	HET	UM	HIGH	A	2	25	147
1	5	TNIHOM	HET	UM	HIGH	E	4	25	209
1	5	TNIHOM	HET	UM	HIGH	E	4	25	123
1	5	TNIHOM	HET	UM	HIGH	E	4	25	136
1	5	TNIHOM	HET	UM	HIGH	E	4	25	253
1	5	TNIHOM	HET	UM	HIGH	E	4	25	83
1	5	TNIHOM	HET	UM	HIGH	E	4	25	140
1	5	TNIHOM	HET	UM	HIGH	E	4	25	156
1	5	TNIHOM	HET	UM	HIGH	E	4	25	148

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	5	TNIHOM	HET	UM	HIGH	E	4	25	169
1	5	TNIHOM	HET	UM	HIGH	E	4	25	235
1	5	TNIHOM	HET	UM	HIGH	E	4	25	137
1	5	TNIHOM	HET	UM	HIGH	E	4	25	197
1	5	TNIHOM	HET	UM	HIGH	E	4	25	205
1	5	TNIHOM	HET	UM	HIGH	E	4	25	198
1	5	TNIHOM	HET	UM	HIGH	I	6	25	180
1	5	TNIHOM	HET	UM	HIGH	I	6	25	170
1	5	TNIHOM	HET	UM	HIGH	I	6	25	266
1	5	TNIHOM	HET	UM	HIGH	I	6	25	153
1	5	TNIHOM	HET	UM	HIGH	I	6	25	201
1	5	TNIHOM	HET	UM	HIGH	I	6	25	236
1	5	TNIHOM	HET	UM	HIGH	I	6	25	242
1	5	TNIHOM	HET	UM	HIGH	I	6	25	58
1	5	TNIHOM	HET	UM	HIGH	I	6	25	176
1	5	TNIHOM	HET	UM	HIGH	I	6	25	173
1	5	TNIHOM	HET	UM	HIGH	I	6	25	208
1	5	TNIHOM	HET	UM	HIGH	I	6	25	193
1	5	TNIHOM	HET	UM	HIGH	I	6	25	229
1	5	TNIHOM	HET	UM	HIGH	I	6	25	185
1	5	TNIHOM	HET	UM	HIGH	I	6	25	146
1	5	TNIHOM	HET	UM	HIGH	I	6	25	216
1	5	TNIHOM	HET	UM	HIGH	I	6	25	76
1	5	TNIHOM	HET	UM	HIGH	P	10	25	240
1	5	TNIHOM	HET	UM	HIGH	P	10	25	138
1	5	TNIHOM	HET	UM	HIGH	P	10	25	162
1	5	TNIHOM	HET	UM	HIGH	P	10	25	208
1	5	TNIHOM	HET	UM	HIGH	P	10	25	181
1	5	TNIHOM	HET	UM	HIGH	P	10	25	227
1	5	TNIHOM	HET	UM	HIGH	P	10	25	199
1	5	TNIHOM	HET	UM	HIGH	P	10	25	91
1	5	TNIHOM	HET	UM	HIGH	P	10	25	263
1	5	TNIHOM	HET	UM	HIGH	P	10	25	208
1	5	TNIHOM	HET	UM	HIGH	P	10	25	284
1	5	TNIHOM	HET	UM	HIGH	P	10	25	101
1	5	TNIHOM	HET	UM	HIGH	P	10	25	221
1	5	TNIHOM	HET	UM	HIGH	P	10	25	188
1	5	TNIHOM	HET	UM	HIGH	P	10	25	240
1	5	TNIHOM	HET	UM	HIGH	P	10	25	234
1	5	TNIHOM	HET	UM	HIGH	P	10	25	281
1	5	TNIHOM	HET	UM	HIGH	P	10	25	205
1	5	TNIHOM	HET	UM	HIGH	P	10	25	232
1	5	TNIHOM	HET	UM	HIGH	P	10	25	222
1	5	TNIHOM	HET	UM	HIGH	P	10	25	230
1	5	TNIHOM	HET	UM	HIGH	P	10	25	218
1	5	TNIHOM	HET	UM	LOW	A	8	100	185
1	5	TNIHOM	HET	UM	LOW	A	8	100	95
1	5	TNIHOM	HET	UM	LOW	A	8	100	218
1	5	TNIHOM	HET	UM	LOW	A	8	100	54
1	5	TNIHOM	HET	UM	LOW	A	8	100	162
1	5	TNIHOM	HET	UM	LOW	A	8	100	145
1	5	TNIHOM	HET	UM	LOW	A	8	100	139
1	5	TNIHOM	HET	UM	LOW	A	8	100	116
1	5	TNIHOM	HET	UM	LOW	A	8	100	86
1	5	TNIHOM	HET	UM	LOW	A	8	100	149
1	5	TNIHOM	HET	UM	LOW	B	16	100	146
1	5	TNIHOM	HET	UM	LOW	B	16	100	196
1	5	TNIHOM	HET	UM	LOW	B	16	100	135
1	5	TNIHOM	HET	UM	LOW	B	16	100	147
1	5	TNIHOM	HET	UM	LOW	B	16	100	217
1	5	TNIHOM	HET	UM	LOW	B	16	100	83
1	5	TNIHOM	HET	UM	LOW	B	16	100	139
1	5	TNIHOM	HET	UM	LOW	B	16	100	172
1	5	TNIHOM	HET	UM	LOW	B	16	100	107
1	5	TNIHOM	HET	UM	LOW	B	16	100	236

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
1	5	TNIHOM	HET	UM	LOW	C	24	100	186
1	5	TNIHOM	HET	UM	LOW	C	24	100	195
1	5	TNIHOM	HET	UM	LOW	C	24	100	180
1	5	TNIHOM	HET	UM	LOW	C	24	100	143
1	5	TNIHOM	HET	UM	LOW	C	24	100	187
1	5	TNIHOM	HET	UM	LOW	C	24	100	82
1	5	BUGHOM	HET	UM	LOW	C	24	100	183
1	5	BUGHOM	HET	UM	LOW	C	24	100	179
1	5	BUGHOM	HET	UM	LOW	C	24	100	219
1	5	BUGHOM	HET	UM	LOW	C	24	100	209
1	5	TNIHOM	HET	UM	LOW	D	40	100	234
1	5	TNIHOM	HET	UM	LOW	D	40	100	216
1	5	TNIHOM	HET	UM	LOW	D	40	100	127
1	5	TNIHOM	HET	UM	LOW	D	40	100	132
1	5	TNIHOM	HET	UM	LOW	D	40	100	150
1	5	TNIHOM	HET	UM	LOW	D	40	100	91
1	5	TNIHOM	HET	UM	LOW	D	40	100	169
1	5	TNIHOM	HET	UM	LOW	D	40	100	150
1	5	TNIHOM	HET	UM	LOW	D	40	100	174
1	5	TNIHOM	HET	UM	LOW	D	40	100	181
1	5	TNIHOM	HET	UM	NO	A	88	400	195
1	5	TNIHOM	HET	UM	NO	A	88	400	154
1	5	TNIHOM	HET	UM	NO	A	88	400	224
1	5	TNIHOM	HET	UM	NO	A	88	400	286
1	5	TNIHOM	HET	UM	NO	A	88	400	165
1	5	TNIHOM	HET	UM	NO	A	88	400	235
1	5	TNIHOM	HET	UM	NO	A	88	400	152
1	5	TNIHOM	HET	UM	NO	A	88	400	228
1	5	TNIHOM	HET	UM	NO	A	88	400	181
1	5	TNIHOM	HET	UM	NO	A	88	400	138
1	5	TNIHOM	HET	UM	NO	A	88	400	216
1	5	TNIHOM	HET	UM	NO	A	88	400	146
1	5	TNIHOM	HET	UM	NO	A	88	400	221
1	5	TNIHOM	HET	UM	NO	A	88	400	168
1	5	TNIHOM	HET	UM	NO	A	88	400	238
1	5	TNIHOM	HET	UM	NO	A	88	400	211
1	5	TNIHOM	HET	UM	NO	A	88	400	220
1	5	TNIHOM	HET	UM	NO	A	88	400	119
1	5	TNIHOM	HET	UM	NO	A	88	400	201
1	5	TNIHOM	HET	UM	NO	A	88	400	95
2	6	TNIHET	HOM	UM	HIGH	D	5.5	9	233
2	6	TNIHET	HOM	UM	HIGH	D	5.5	9	225
2	6	TNIHET	HOM	UM	HIGH	D	5.5	9	212
2	6	TNIHET	HOM	UM	HIGH	D	5.5	9	240
2	6	TNIHET	HOM	UM	HIGH	D	5.5	9	250
2	6	TNIHET	HOM	UM	HIGH	D	5.5	9	195
2	6	TNIHET	HOM	UM	HIGH	D	5.5	9	231
2	6	TNIHET	HOM	UM	HIGH	D	5.5	9	217
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	200
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	209
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	217
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	165
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	65
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	59
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	185
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	166
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	182
2	6	TNIHET	HOM	UM	HIGH	H	5.5	18	161
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	120
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	210
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	178
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	150
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	105
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	159
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	161

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	33
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	49
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	155
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	187
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	152
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	126
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	65
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	165
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	84
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	141
2	6	TNIHET	HOM	UM	HIGH	L	5.5	27	174
2	6	TNIHET	HOM	UM	LOW	A	22	36	172
2	6	TNIHET	HOM	UM	LOW	A	22	36	226
2	6	TNIHET	HOM	UM	LOW	A	22	36	214
2	6	TNIHET	HOM	UM	LOW	A	22	36	222
2	6	TNIHET	HOM	UM	LOW	A	22	36	225
2	6	TNIHET	HOM	UM	LOW	A	22	36	179
2	6	TNIHET	HOM	UM	LOW	A	22	36	228
2	6	TNIHET	HOM	UM	LOW	A	22	36	233
2	6	TNIHET	HOM	UM	LOW	A	22	36	93
2	6	TNIHET	HOM	UM	LOW	A	22	36	196
2	6	TNIHET	HOM	UM	LOW	B	22	72	145
2	6	TNIHET	HOM	UM	LOW	B	22	72	128
2	6	TNIHET	HOM	UM	LOW	B	22	72	170
2	6	TNIHET	HOM	UM	LOW	B	22	72	182
2	6	TNIHET	HOM	UM	LOW	B	22	72	207
2	6	TNIHET	HOM	UM	LOW	B	22	72	124
2	6	TNIHET	HOM	UM	LOW	B	22	72	127
2	6	TNIHET	HOM	UM	LOW	B	22	72	175
2	6	TNIHET	HOM	UM	LOW	B	22	72	142
2	6	TNIHET	HOM	UM	LOW	B	22	72	154
2	6	TNIHET	HOM	UM	LOW	C	22	108	228
2	6	TNIHET	HOM	UM	LOW	C	22	108	141
2	6	TNIHET	HOM	UM	LOW	C	22	108	172
2	6	TNIHET	HOM	UM	LOW	C	22	108	210
2	6	TNIHET	HOM	UM	LOW	C	22	108	29
2	6	TNIHET	HOM	UM	LOW	C	22	108	185
2	6	TNIHET	HOM	UM	LOW	C	22	108	129
2	6	TNIHET	HOM	UM	LOW	C	22	108	153
2	6	TNIHET	HOM	UM	LOW	C	22	108	76
2	6	TNIHET	HOM	UM	LOW	C	22	108	208
2	6	TNIHET	HOM	UM	LOW	D	22	184	142
2	6	TNIHET	HOM	UM	LOW	D	22	184	142
2	6	TNIHET	HOM	UM	LOW	D	22	184	126
2	6	TNIHET	HOM	UM	LOW	D	22	184	158
2	6	TNIHET	HOM	UM	LOW	D	22	184	177
2	6	TNIHET	HOM	UM	LOW	D	22	184	147
2	6	TNIHET	HOM	UM	LOW	D	22	184	148
2	6	TNIHET	HOM	UM	LOW	D	22	184	71
2	6	TNIHET	HOM	UM	LOW	D	22	184	127
2	6	TNIHET	HOM	UM	LOW	D	22	184	44
2	6	TNIHET	HOM	UM	NO	A	88	400	190
2	6	TNIHET	HOM	UM	NO	A	88	400	39
2	6	TNIHET	HOM	UM	NO	A	88	400	80
2	6	TNIHET	HOM	UM	NO	A	88	400	137
2	6	TNIHET	HOM	UM	NO	A	88	400	185
2	6	TNIHET	HOM	UM	NO	A	88	400	96
2	6	TNIHET	HOM	UM	NO	A	88	400	35
2	6	TNIHET	HOM	UM	NO	A	88	400	84
2	6	TNIHET	HOM	UM	NO	A	88	400	88
2	6	TNIHET	HOM	UM	NO	A	88	400	64
2	6	TNIHET	HET	M	HIGH	A	2	9	226
2	6	TNIHET	HET	M	HIGH	A	2	9	172
2	6	TNIHET	HET	M	HIGH	A	2	9	180

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
2	6	TNIHET	HET	M	HIGH	A	2	9	142
2	6	TNIHET	HET	M	HIGH	A	2	9	155
2	6	TNIHET	HET	M	HIGH	A	2	9	193
2	6	TNIHET	HET	M	HIGH	A	2	9	117
2	6	TNIHET	HET	M	HIGH	A	2	9	94
2	6	TNIHET	HET	M	HIGH	E	4	18	197
2	6	TNIHET	HET	M	HIGH	E	4	18	209
2	6	TNIHET	HET	M	HIGH	E	4	18	127
2	6	TNIHET	HET	M	HIGH	E	4	18	197
2	6	TNIHET	HET	M	HIGH	E	4	18	213
2	6	TNIHET	HET	M	HIGH	E	4	18	193
2	6	TNIHET	HET	M	HIGH	E	4	18	153
2	6	TNIHET	HET	M	HIGH	E	4	18	235
2	6	TNIHET	HET	M	HIGH	E	4	18	194
2	6	TNIHET	HET	M	HIGH	E	4	18	30
2	6	TNIHET	HET	M	HIGH	E	4	18	146
2	6	TNIHET	HET	M	HIGH	E	4	18	137
2	6	TNIHET	HET	M	HIGH	E	4	18	191
2	6	TNIHET	HET	M	HIGH	E	4	18	156
2	6	TNIHET	HET	M	HIGH	I	6	27	229
2	6	TNIHET	HET	M	HIGH	I	6	27	125
2	6	TNIHET	HET	M	HIGH	I	6	27	212
2	6	TNIHET	HET	M	HIGH	I	6	27	75
2	6	TNIHET	HET	M	HIGH	I	6	27	65
2	6	TNIHET	HET	M	HIGH	I	6	27	177
2	6	TNIHET	HET	M	HIGH	I	6	27	177
2	6	TNIHET	HET	M	HIGH	I	6	27	135
2	6	TNIHET	HET	M	HIGH	I	6	27	219
2	6	TNIHET	HET	M	HIGH	I	6	27	122
2	6	TNIHET	HET	M	HIGH	M	10	46	275
2	6	TNIHET	HET	M	HIGH	M	10	46	84
2	6	TNIHET	HET	M	HIGH	M	10	46	148
2	6	TNIHET	HET	M	HIGH	M	10	46	178
2	6	TNIHET	HET	M	HIGH	M	10	46	181
2	6	TNIHET	HET	M	HIGH	M	10	46	91
2	6	TNIHET	HET	M	HIGH	M	10	46	135
2	6	TNIHET	HET	M	HIGH	M	10	46	218
2	6	TNIHET	HET	M	HIGH	M	10	46	236
2	6	TNIHET	HET	M	HIGH	M	10	46	306
2	6	TNIHET	HET	M	LOW	A	8	36	222
2	6	TNIHET	HET	M	LOW	A	8	36	200
2	6	TNIHET	HET	M	LOW	A	8	36	214
2	6	TNIHET	HET	M	LOW	A	8	36	67
2	6	TNIHET	HET	M	LOW	A	8	36	113
2	6	TNIHET	HET	M	LOW	A	8	36	192
2	6	TNIHET	HET	M	LOW	A	8	36	71
2	6	TNIHET	HET	M	LOW	A	8	36	211
2	6	TNIHET	HET	M	LOW	A	8	36	67
2	6	TNIHET	HET	M	LOW	A	8	36	101
2	6	TNIHET	HET	M	LOW	B	16	72	219
2	6	TNIHET	HET	M	LOW	B	16	72	111
2	6	TNIHET	HET	M	LOW	B	16	72	209
2	6	TNIHET	HET	M	LOW	B	16	72	206
2	6	TNIHET	HET	M	LOW	B	16	72	183
2	6	TNIHET	HET	M	LOW	B	16	72	97
2	6	TNIHET	HET	M	LOW	B	16	72	185
2	6	TNIHET	HET	M	LOW	B	16	72	20
2	6	TNIHET	HET	M	LOW	B	16	72	215
2	6	TNIHET	HET	M	LOW	B	16	72	204
2	6	TNIHET	HET	M	LOW	C	24	108	206
2	6	TNIHET	HET	M	LOW	C	24	108	296
2	6	TNIHET	HET	M	LOW	C	24	108	177
2	6	TNIHET	HET	M	LOW	C	24	108	236
2	6	TNIHET	HET	M	LOW	C	24	108	81

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
2	6	TNIHET	HET	M	LOW	C	24	108	216
2	6	TNIHET	HET	M	LOW	C	24	108	193
2	6	TNIHET	HET	M	LOW	C	24	108	181
2	6	TNIHET	HET	M	LOW	C	24	108	208
2	6	TNIHET	HET	M	LOW	C	24	108	266
2	6	TNIHET	HET	M	LOW	D	40	184	206
2	6	TNIHET	HET	M	LOW	D	40	184	217
2	6	TNIHET	HET	M	LOW	D	40	184	156
2	6	TNIHET	HET	M	LOW	D	40	184	155
2	6	TNIHET	HET	M	LOW	D	40	184	91
2	6	TNIHET	HET	M	LOW	D	40	184	200
2	6	TNIHET	HET	M	LOW	D	40	184	146
2	6	TNIHET	HET	M	LOW	D	40	184	90
2	6	TNIHET	HET	M	LOW	D	40	184	77
2	6	TNIHET	HET	M	LOW	D	40	184	117
2	6	TNIHET	HET	M	NO	A	88	400	233
2	6	TNIHET	HET	M	NO	A	88	400	211
2	6	TNIHET	HET	M	NO	A	88	400	214
2	6	TNIHET	HET	M	NO	A	88	400	141
2	6	TNIHET	HET	M	NO	A	88	400	67
2	6	TNIHET	HET	M	NO	A	88	400	223
2	6	TNIHET	HET	M	NO	A	88	400	74
2	6	TNIHET	HET	M	NO	A	88	400	132
2	6	TNIHET	HET	M	NO	A	88	400	67
2	6	TNIHET	HET	M	NO	A	88	400	160
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	330
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	173
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	207
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	249
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	192
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	284
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	210
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	107
2	7	TNIHET	HOM	UM	HIGH	D	5.5	9	108
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	273
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	195
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	241
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	209
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	180
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	128
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	56
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	255
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	181
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	260
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	231
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	144
2	7	TNIHET	HOM	UM	HIGH	H	5.5	18	51
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	223
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	15
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	208
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	40
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	229
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	107
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	191
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	46
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	217
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	41
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	173
2	7	TNIHET	HOM	UM	HIGH	P	5.5	46	60
2	7	TNIHET	HOM	UM	LOW	A	22	36	137
2	7	TNIHET	HOM	UM	LOW	A	22	36	262
2	7	TNIHET	HOM	UM	LOW	A	22	36	171
2	7	TNIHET	HOM	UM	LOW	A	22	36	137
2	7	TNIHET	HOM	UM	LOW	A	22	36	104

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
2	7	TNIHET	HOM	UM	LOW	A	22	36	58
2	7	TNIHET	HOM	UM	LOW	A	22	36	284
2	7	TNIHET	HOM	UM	LOW	A	22	36	122
2	7	TNIHET	HOM	UM	LOW	A	22	36	174
2	7	TNIHET	HOM	UM	LOW	A	22	36	286
2	7	TNIHET	HOM	UM	LOW	B	22	72	229
2	7	TNIHET	HOM	UM	LOW	B	22	72	200
2	7	TNIHET	HOM	UM	LOW	B	22	72	134
2	7	TNIHET	HOM	UM	LOW	B	22	72	66
2	7	TNIHET	HOM	UM	LOW	B	22	72	43
2	7	TNIHET	HOM	UM	LOW	B	22	72	126
2	7	TNIHET	HOM	UM	LOW	B	22	72	171
2	7	TNIHET	HOM	UM	LOW	B	22	72	221
2	7	TNIHET	HOM	UM	LOW	B	22	72	103
2	7	TNIHET	HOM	UM	LOW	B	22	72	79
2	7	TNIHET	HOM	UM	LOW	C	22	108	225
2	7	TNIHET	HOM	UM	LOW	C	22	108	219
2	7	TNIHET	HOM	UM	LOW	C	22	108	197
2	7	TNIHET	HOM	UM	LOW	C	22	108	29
2	7	TNIHET	HOM	UM	LOW	C	22	108	157
2	7	TNIHET	HOM	UM	LOW	C	22	108	143
2	7	TNIHET	HOM	UM	LOW	C	22	108	149
2	7	TNIHET	HOM	UM	LOW	C	22	108	31
2	7	TNIHET	HOM	UM	LOW	C	22	108	170
2	7	TNIHET	HOM	UM	LOW	C	22	108	257
2	7	TNIHET	HOM	UM	LOW	D	22	184	213
2	7	TNIHET	HOM	UM	LOW	D	22	184	106
2	7	TNIHET	HOM	UM	LOW	D	22	184	55
2	7	TNIHET	HOM	UM	LOW	D	22	184	79
2	7	TNIHET	HOM	UM	LOW	D	22	184	200
2	7	TNIHET	HOM	UM	LOW	D	22	184	194
2	7	TNIHET	HOM	UM	LOW	D	22	184	64
2	7	TNIHET	HOM	UM	LOW	D	22	184	79
2	7	TNIHET	HOM	UM	LOW	D	22	184	72
2	7	TNIHET	HOM	UM	LOW	D	22	184	28
2	7	TNIHET	HOM	UM	NO	A	88	400	155
2	7	TNIHET	HOM	UM	NO	A	88	400	228
2	7	TNIHET	HOM	UM	NO	A	88	400	282
2	7	TNIHET	HOM	UM	NO	A	88	400	145
2	7	TNIHET	HOM	UM	NO	A	88	400	143
2	7	TNIHET	HOM	UM	NO	A	88	400	72
2	7	TNIHET	HOM	UM	NO	A	88	400	123
2	7	TNIHET	HOM	UM	NO	A	88	400	167
2	7	TNIHET	HOM	UM	NO	A	88	400	226
2	7	TNIHET	HOM	UM	NO	A	88	400	181
2	7	TNIHET	HOM	UM	NO	A	88	400	131
2	7	TNIHET	HOM	UM	NO	A	88	400	126
2	7	TNIHET	HOM	UM	NO	A	88	400	93
2	7	TNIHET	HOM	UM	NO	A	88	400	100
2	7	TNIHET	HOM	UM	NO	A	88	400	137
2	7	TNIHET	HOM	UM	NO	A	88	400	131
2	7	TNIHET	HOM	UM	NO	A	88	400	167
2	7	TNIHET	HOM	UM	NO	A	88	400	176
2	7	TNIHET	HOM	UM	NO	A	88	400	132
2	7	TNIHET	HOM	UM	NO	A	88	400	207
2	7	TNIHET	HET	M	HIGH	D	2	9	62
2	7	TNIHET	HET	M	HIGH	D	2	9	51
2	7	TNIHET	HET	M	HIGH	D	2	9	65
2	7	TNIHET	HET	M	HIGH	D	2	9	111
2	7	TNIHET	HET	M	HIGH	D	2	9	73
2	7	TNIHET	HET	M	HIGH	D	2	9	114
2	7	TNIHET	HET	M	HIGH	D	2	9	30
2	7	TNIHET	HET	M	HIGH	D	2	9	61
2	7	TNIHET	HET	M	HIGH	D	2	9	51

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
2	7	TNIHET	HET	M	HIGH	H	4	18	207
2	7	TNIHET	HET	M	HIGH	H	4	18	228
2	7	TNIHET	HET	M	HIGH	H	4	18	91
2	7	TNIHET	HET	M	HIGH	H	4	18	68
2	7	TNIHET	HET	M	HIGH	H	4	18	96
2	7	TNIHET	HET	M	HIGH	H	4	18	66
2	7	TNIHET	HET	M	HIGH	H	4	18	73
2	7	TNIHET	HET	M	HIGH	H	4	18	197
2	7	TNIHET	HET	M	HIGH	H	4	18	57
2	7	TNIHET	HET	M	HIGH	H	4	18	70
2	7	TNIHET	HET	M	HIGH	L	6	27	221
2	7	TNIHET	HET	M	HIGH	L	6	27	196
2	7	TNIHET	HET	M	HIGH	L	6	27	258
2	7	TNIHET	HET	M	HIGH	L	6	27	192
2	7	TNIHET	HET	M	HIGH	L	6	27	154
2	7	TNIHET	HET	M	HIGH	L	6	27	148
2	7	TNIHET	HET	M	HIGH	L	6	27	113
2	7	TNIHET	HET	M	HIGH	L	6	27	136
2	7	TNIHET	HET	M	HIGH	L	6	27	57
2	7	TNIHET	HET	M	HIGH	L	6	27	53
2	7	TNIHET	HET	M	HIGH	P	10	46	288
2	7	TNIHET	HET	M	HIGH	P	10	46	204
2	7	TNIHET	HET	M	HIGH	P	10	46	267
2	7	TNIHET	HET	M	HIGH	P	10	46	211
2	7	TNIHET	HET	M	HIGH	P	10	46	204
2	7	TNIHET	HET	M	HIGH	P	10	46	282
2	7	TNIHET	HET	M	HIGH	P	10	46	218
2	7	TNIHET	HET	M	HIGH	P	10	46	242
2	7	TNIHET	HET	M	HIGH	P	10	46	80
2	7	TNIHET	HET	M	HIGH	P	10	46	54
2	7	TNIHET	HET	M	LOW	A	8	36	229
2	7	TNIHET	HET	M	LOW	A	8	36	107
2	7	TNIHET	HET	M	LOW	A	8	36	130
2	7	TNIHET	HET	M	LOW	A	8	36	106
2	7	TNIHET	HET	M	LOW	A	8	36	94
2	7	TNIHET	HET	M	LOW	A	8	36	67
2	7	TNIHET	HET	M	LOW	A	8	36	81
2	7	TNIHET	HET	M	LOW	A	8	36	123
2	7	TNIHET	HET	M	LOW	A	8	36	185
2	7	TNIHET	HET	M	LOW	A	8	36	239
2	7	TNIHET	HET	M	LOW	B	16	72	114
2	7	TNIHET	HET	M	LOW	B	16	72	44
2	7	TNIHET	HET	M	LOW	B	16	72	135
2	7	TNIHET	HET	M	LOW	B	16	72	52
2	7	TNIHET	HET	M	LOW	B	16	72	146
2	7	TNIHET	HET	M	LOW	B	16	72	47
2	7	TNIHET	HET	M	LOW	B	16	72	144
2	7	TNIHET	HET	M	LOW	B	16	72	47
2	7	TNIHET	HET	M	LOW	B	16	72	95
2	7	TNIHET	HET	M	LOW	B	16	72	137
2	7	TNIHET	HET	M	LOW	C	24	108	157
2	7	TNIHET	HET	M	LOW	C	24	108	135
2	7	TNIHET	HET	M	LOW	C	24	108	138
2	7	TNIHET	HET	M	LOW	C	24	108	152
2	7	TNIHET	HET	M	LOW	C	24	108	197
2	7	TNIHET	HET	M	LOW	C	24	108	187
2	7	TNIHET	HET	M	LOW	C	24	108	221
2	7	TNIHET	HET	M	LOW	C	24	108	111
2	7	TNIHET	HET	M	LOW	C	24	108	62
2	7	TNIHET	HET	M	LOW	C	24	108	54
2	7	TNIHET	HET	M	LOW	D	40	184	204
2	7	TNIHET	HET	M	LOW	D	40	184	153
2	7	TNIHET	HET	M	LOW	D	40	184	151
2	7	TNIHET	HET	M	LOW	D	40	184	194

EXPERIMENT	REP	T. NI	FOOD	M/UM	FRAG	INDEX	FOODAMT	INTRO TNI	INDMASS
2	7	TNIHET	HET	M	LOW	D	40	184	215
2	7	TNIHET	HET	M	LOW	D	40	184	150
2	7	TNIHET	HET	M	LOW	D	40	184	145
2	7	TNIHET	HET	M	LOW	D	40	184	146
2	7	TNIHET	HET	M	LOW	D	40	184	217
2	7	TNIHET	HET	M	LOW	D	40	184	159
2	7	TNIHET	HET	M	NO	A	88	400	198
2	7	TNIHET	HET	M	NO	A	88	400	202
2	7	TNIHET	HET	M	NO	A	88	400	238
2	7	TNIHET	HET	M	NO	A	88	400	172
2	7	TNIHET	HET	M	NO	A	88	400	211
2	7	TNIHET	HET	M	NO	A	88	400	169
2	7	TNIHET	HET	M	NO	A	88	400	208
2	7	TNIHET	HET	M	NO	A	88	400	202
2	7	TNIHET	HET	M	NO	A	88	400	76
2	7	TNIHET	HET	M	NO	A	88	400	172
2	7	TNIHET	HET	M	NO	A	88	400	177
2	7	TNIHET	HET	M	NO	A	88	400	60
2	7	TNIHET	HET	M	NO	A	88	400	189
2	7	TNIHET	HET	M	NO	A	88	400	180
2	7	TNIHET	HET	M	NO	A	88	400	162
2	7	TNIHET	HET	M	NO	A	88	400	147
2	7	TNIHET	HET	M	NO	A	88	400	164
2	7	TNIHET	HET	M	NO	A	88	400	164
2	7	TNIHET	HET	M	NO	A	88	400	66
2	7	TNIHET	HET	M	NO	A	88	400	119