

Is Sliced Bread All It's Cracked Up to Be? A Randomized Control Trial

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Abstract

Purpose Humans have been eating bread for approximately 12,000 years. Bread—that is, foods made by baking combinations of flour and water—has been a staple of the human diet. Little has changed about bread, which is still eaten in all the basic forms devised after the domestication of grain grasses. Whether unleavened bread, such as pita, or leavened bread (that is, made with soda or yeast), bread is the same food our ancestors ate.

There is no doubt that sliced bread has many advantages—especially to small children, the arthritic, and the slicing-impaired. But there have been no firm data establishing that pre-sliced loaves of bread are better than intact (that is, unsliced) loaves. (Anecdotal evidence from gourmets and home bakers cannot be considered scientifically valid.) We conducted a randomized control trial to determine whether people really do prefer sliced (that is, pre-sliced) bread.

Results Consumption of bread was similar in the two research groups: The mean difference was 0.1 (-0.1 to 0.3) kg. Bread happiness was similar in the two groups: 3.7 (3.0-4.4) in the sliced-bread group, and 3.5 (3.0-4.0) in the intact-loaf group. Bread happiness at 3-month follow-up showed no statistically significant differences.

Conclusion Therefore, use of “sliced bread” as a gold standard needs to be re-evaluated. More research is needed. Nonetheless, it seems warranted to forego—and warn against—use of the customary cliché “greater than sliced bread.”

Introduction

Humans have been eating bread for approximately 12,000 years. Bread—that is, foods made by baking combinations of flour and water—has been a staple of the human diet. Little has changed about bread, which is still eaten in all the basic forms devised after the domestication of grain grasses. Whether unleavened bread, such as pita, or leavened bread (that is, made with soda or yeast), bread is the same food our ancestors ate.

One of the most recent improvements was sliced bread—or, to be more precise, pre-sliced bread. Bread had always been sliced. In the past, people had to tear bread into pieces, which can be difficult for small children and people with arthritis. And special bread knives were invented, so that a person could cut high-quality bread into slices without mangling the soft interiors. This led to a regrettable increase in hand wounds. (The modern equivalent is the “bagel cut” so common in U.S. emergency rooms on Sunday mornings.¹)

Otto Frederick Rohwedder sought a safe alternative to torn bread and hand-sliced bread.² He began work on inventing the bread slicer in 1912. (At first, he tried the idea of a device that held the slices together with hat pins but this was not successful.) In 1928, however, he designed a machine that sliced bread and then automatically wrapped it to prevent the sliced bread from going stale.

Pre-sliced bread was popularized by Wonder Bread™ in 1930. Although an association has been shown between the rapid spread of sliced bread and an overall decline in the quality of bread in the United States, no causal relationship has ever been demonstrated.

The popularity of pre-sliced bread, and the advanced technology behind it, led to a popular saying still occasionally heard today: “The greatest thing since sliced bread” has been used for decades to express admiration of a new invention.

There is no doubt that sliced bread has many advantages—especially to small children, the arthritic, and the slicing-impaired. But there have been no firm data establishing that pre-sliced loaves of bread are better than intact (that is, unsliced) loaves. (Anecdotal evidence from gourmets and home bakers cannot be considered scientifically valid.)

We conducted a randomized control trial to determine whether people really do prefer sliced (that is, pre-sliced) bread.

Methods

One thousand bread-consuming volunteer families, each consisting of three or more persons between the ages of 2 and 75 years, living in the San Francisco area, were randomly allocated to receive either sliced bread ($n = 503$) or intact loaves ($n = 497$) for 1 year. A choice of breads (including sourdough and cracked wheat) was delivered free daily.

The bread was radiolabeled with yeast⁷⁵ to facilitate blinded measurement of the amount discarded in the trash. The procedure for radiolabeling the bread was developed by the Yeast Bread Institute at Tufts University, as originally reported in 1975 and revised in 1988 and 2001.³ (The yeast⁷⁵ was obtained from RadioYeast, Inc., Brookstone, Massachusetts.) The radiolabeling process met all applicable standards of the Atomic Energy Commission, as well as ANSI standard 97-G42 for flour-based, yeast-mediated food products. Provisions of the Nuclear Non-proliferation Treaty do not apply.

The bread was produced by Academic Research Bakers and Confectioners (Palo Alto, California), a standard provider of bread products for scientific research.

We measured happiness with the bread on a bread satisfaction-happiness score (BS-H). The scale, based on the Satisfaction with Food Score (SWFS) of Boule and Baggette⁴, has been validated in studies over the past 20 years. The BS-H uses a Likert-type scale ranging from 1 (least happy) to 7 (happiest).

Bread preference, measured as weekly consumption (kg delivered minus kg discarded), was estimated. Mean consumption and happiness per group, and the mean difference between the groups (sliced loaf minus intact loaf), with 95% confidence intervals (CI), were determined.

Results

The results were based on a 2x2 analysis: families eating whole wheat bread, sliced and intact; and those eating sourdough bread, sliced and intact.

Consumption of bread was similar in the two groups: The mean difference was 0.1 (-0.1 to 0.3) kg. Families in the sliced-bread group consumed 1.23 (0.9-1.5) kg per week, whereas families in the intact-loaf group ate 1.3 (0.8-1.8) kg per week. More families in the intact-loaf group than in the sliced-bread group consumed 2 or more kg of bread per week (34% vs. 26%; $P < .01$ by chi-square), but fewer families in the sliced-bread group ate no bread at all (3% vs. 8% in the intact-loaf group; $P < .002$). Bread happiness was similar in the two groups: 3.5 (3.0-4.0) in the sliced-bread group, and 3.7 (3.0-4.4) in the intact-loaf group.

Discussion

The findings of this study reveal similar bread consumption by the families receiving sliced bread and those receiving intact bread, although the groups differed at the extreme ends of the spectrum. Also, happiness with the bread was similar in the two groups.

However, it is premature to draw firm conclusions about these findings. The study had several limitations. First, the study was conducted in one metropolitan area. Further, the San Francisco area differs considerably from the rest of the United States in several statistically significant ways. Therefore, it is not clear that the findings can be generalized to other parts of the country.

Second, the study did not include non-bread-eaters. It is theoretically possible that they could have decided opinions about the utility or safety of sliced bread over intact bread, even though they do not eat it. In fact, because they did not have daily, intimate contact with bread, their opinions might be more flexible and diverse than those of bread-eaters, who are well known to be an opinionated and argumentative segment of the population.

Third, the study did not control for demographic, economic, religious/spiritual, or educational factors that might distinguish the study groups from each other. For example, it is possible that low-income families were disproportionately represented because the bread was free. On the other hand, because both sourdough and whole wheat bread are minority preferences, occurring primarily among Californians and health-pursuers, it is possible that the decision not to include white bread among the choices was a major confounding factor.

Nonetheless, we feel that the study is basically reliable because the study had excellent standards of statistical analysis, which would tend to outweigh the factors discussed above.

Conclusions

“Greater than sliced bread” does not seem to apply to actual bread consumption, certainly not in the sample studied. Therefore, use of “sliced bread” as a gold standard needs to be re-evaluated. More research is needed in order to know whether these findings are applicable to other areas of the country, to rural as well as urban/suburban areas, and to all demographic groups. Nonetheless, it seems warranted to forego—and warn against—use of the customary cliché “greater than sliced bread.”

Table 1
Consumption of sliced and intact-loaves of bread, San Francisco, 2004

Type of bread	sliced (n = 503)		intact (n = 497)	
	consumption	happiness	consumption	happiness
sourdough	0.9	3.0	0.8	3.0
whole wheat	1.5	4.4	1.8	3.0
<i>overall</i>	1.23	3.7	1.3	3.5

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Research design—all authors
 Conduct of study—Dr. Echo
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