

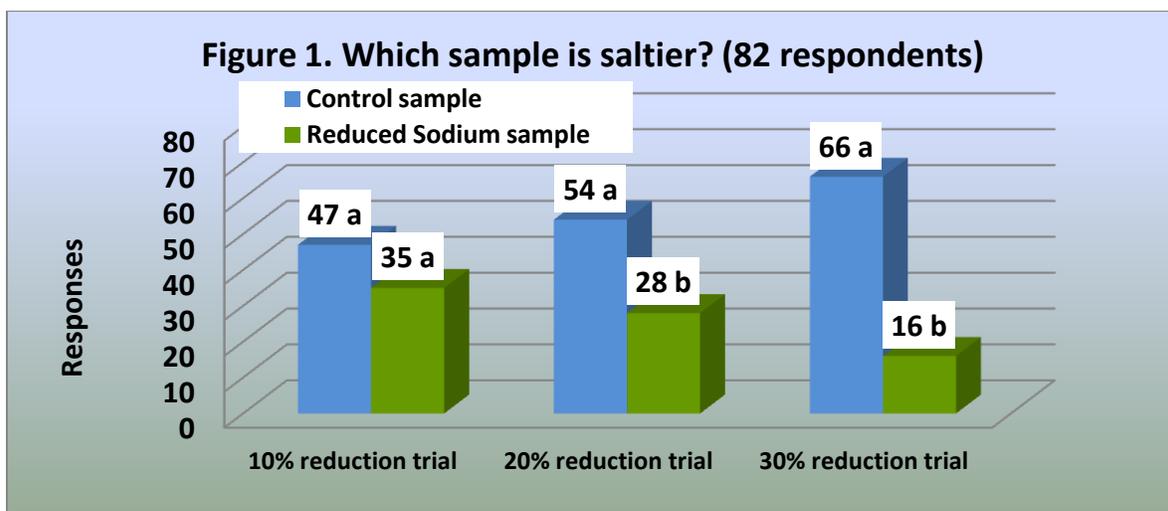
## Sodium Reduction in Bread Sensory Testing

Bread is an important part of the American diet and a good source of nutrients and fiber. However, because we eat bread so often, it is also the **single largest contributor of sodium** to the American diet. Consuming too much sodium contributes to a person’s risk for high blood pressure. High blood pressure increases a person’s risk for heart disease and stroke, which together are the number one cause of death in Oregon and nationwide.

There is very little research on sodium reduction in bread, and most of the research has been conducted outside of the United States. Existing research findings cannot be applied to the United States population because taste preferences and individual sodium consumption vary from country to country. The Oregon Health Authority collaborated with the Oregon State University Food Innovation Center, located in Portland, to conduct research on consumer acceptance and ability to detect sensory differences (e.g., taste, textures, aroma) of reduced sodium bread products.

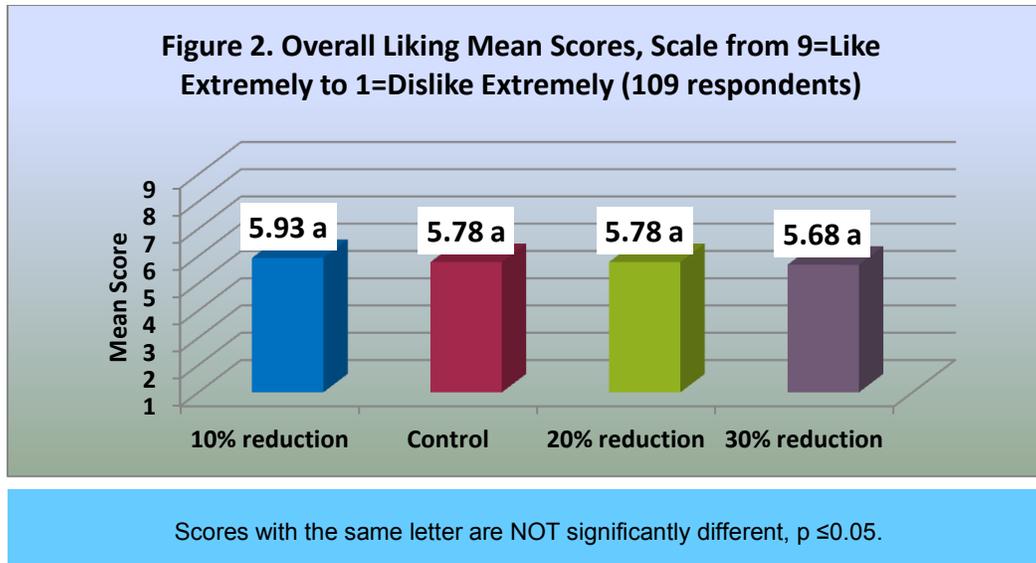
Directional difference testing was run to determine consumers’ ability to detect the difference in sodium levels in four batches of 50% whole wheat sandwich bread. A directional difference test is a sensory method that determines whether a difference exists in the perceived intensity of a specified attribute (sodium) between two samples.

Four different breads were baked by the Wheat Marketing Center with the following sodium levels: control (sodium chloride was 2% of flour at 14% moisture basis), 10% sodium reduction of control, 20% sodium reduction of control and 30% sodium reduction of control. Consumers in Portland, Oregon who were recruited to participate based on being users and likers of sandwich bread, were able to correctly detect differences in sodium at both the 20% and 30% reduction from control tests, but not at the 10% reduction level (Figure 1).



One-sided directional paired comparison. Scores with the same letter are NOT significantly different,  $p \leq 0.05$ .

A second sensory test was conducted with different consumers to establish the acceptability of bread with reduced sodium. 109 consumers in Portland, Oregon, who were users and likers of sandwich bread, rated the four breads on overall liking (acceptability), appearance, aroma, flavor, sweetness, salt level and texture. No significant differences in acceptability (Figure 2) or sensory attributes were found.



Though consumers could tell a difference in the sodium levels of 50% whole wheat sandwich bread at a 20% and 30% reduction in salt, they reported no difference in acceptability of any of the reduced sodium breads tested (10%, 20% and 30% reduction levels).

Participants in the two tests answered additional questions related to sodium use, their efforts if any to reduce sodium consumption as individuals, and other related questions. More information will be available as analysis proceeds. The majority were very or somewhat supportive (83%) of activities by food manufacturers to reduce sodium in foods.

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