# Which type of food elderly people prefer? Exploration in a virtual reality environment

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## Background

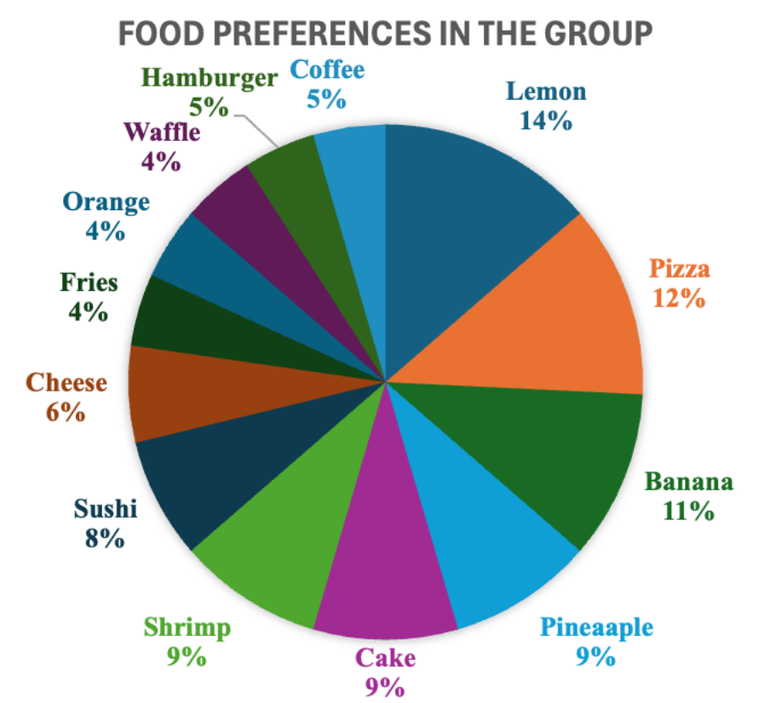
Virtual Reality (VR) has become a valuable tool to explore foods' preferences in a controlled and measurable environment (Oliver et al., 2021). Using VR it is possible to manipulate the environment to investigate consumer preferences, behaviors, and reactions under precisely controlled conditions and to objectively measure the interaction with the presented stimuli (Zulkarnain et al., 2024). In addition, the integration with physiological signals can allow to measure the emotional response to the foods with which the subject interacts. Thus, the purpose of this study is to present a system that integrates a virtual environment with wearables sensors to explore food preferences in particular in elderly subjects.

## Methods

- 12 elderly subjects
- Scenario: kitchen and various sets of food (healthy and unhealthy), to be placed on a kitchen table.
- Procedure: 1 minutes of baseline, 3 minutes of freely interaction with the kitchen virtual environment.
- Devices: Oculus Quest2, Shimmer ECG Unit, Shimmer3GSR+ Unit
- Analysis: pre-processing, features extraction measuring the activation of the brain and of the autonomic nervous system and graphs of food preference.

## Results

| Feature | Value |
|---|---|
| HR (bpm) | 84.85 |
| SDNN (ms) | 0.044 |
| RMSSD | 0.053 |
| LF (nu) | 0.210 |
| HF (nu) | 0.424 |
| LF/FH | 1.783 |




## Conclusions

In this study, we proposed a multimodal system for the analysis of consumer's preferences for foods, integrating VR and wearable sensors for the acquisition of physiological signals. In general, we observed a preference for sweety food including pineapple, banana, cake and shrimps. From the physiological point of view there is a prevalence of activation of the sympathetic nervous system during the task.

The data collected with the proposed system, integrated with other biological or medical data, can allow to evaluate the risk of obesity or other metabolic diseases in elderly due to preference for unhealthy or fat food.

**References**

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