



klöckner pentaplast

white paper

EYETRACKING STUDY REPORT:

Plastic Thermoformed vs Plastic Flexible Pouch Package

Package InSight, LLC

EXECUTIVE SUMMARY

Different packaging options can make an enormous difference to the bottom line, both through manufacturing costs and influencing a customer's point of sale decision. Klöckner Pentaplast worked with Package InSight, LLC conducting a study to examine the effects of different substrates on cheese, specifically a rigid thermoformed package and a flexible cheese four-sided pouch. The study was conducted in CUshop™ at Clemson University, a research lab with space to customize immersive shopping environments.

To accomplish this study, over three days 116 participants wore eyetracking glasses within a retail laboratory while shopping for products on a provided list. During this process, participants' eye movements were recorded and used to corroborate the results and provide insights on why participants purchased the item they did. Analysis for both cheese packages tested was completed for the shopping list results and eye movements from each participant and in aggregate. Participants also completed two surveys for demographic inquiry and qualitative product measurement.

Eyetracking results found that rigid thermoformed packaging was viewed faster and longer than flexible plastic packaging. Qualitative data confirmed this discovery by revealing that participants rated the cheese in the thermoformed package to be of higher quality, easier to open, and more hygienic. These quantitative and qualitative data points correlate with the participants' decision-making, where the thermoformed package had the highest purchase rate by consumers.

METHODOLOGY

Eyetracking

A pair of mobile eyetracking glasses was utilized in this study. The trackers look similar to reading glasses but have specialized technology attached to track and record a participant's eye movement at an extremely high rate. The mobility of this technology allows the participant to move and shop naturally in the shopping environment.

Participants and Demographics

116 participants (46 male, 70 female) participated in the study. Participants were recruited from Package InSight's participant index and incentivized with an Amazon.com gift card. Participant's ages ranged from 18 to over 65, with 78% between the ages of 21 and 49.

Participants had an evenly distributed income, with about half falling in the \$50,000 to \$149,999 income brackets and 64% of all participants were the primary shopper for their household (another 27% were sometimes the primary shopper). Educational levels varied with most participants having completed at least a bachelor degree.

Other questions regarding the participant screening requirements were asked in the pre-shopping surveys as a method of double checking the screener effectiveness.

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Experimental Design and Procedure

Once calibrated to the eyetracking glasses, participants were provided a shopping list and instructed to go into the store and select a product for each item on the list. The prompt for this study was “Sharp Cheddar Cheese”. The shopping list order was randomized to force participants to approach the shelves in different patterns. Participants were instructed not to pick up any products but only to write down the number corresponding to their preferred product choice on their checklist.

PRODUCT PACKAGES TESTED



After selecting a product for each item on the shopping list and exiting the shop, participants were guided to a debriefing area where they answered a short post-experiment questionnaire that collected qualitative information regarding the packages they viewed.

Sharp cheddar cheese slices – plastic thermoformed (left) and plastic flexible pouch (right)

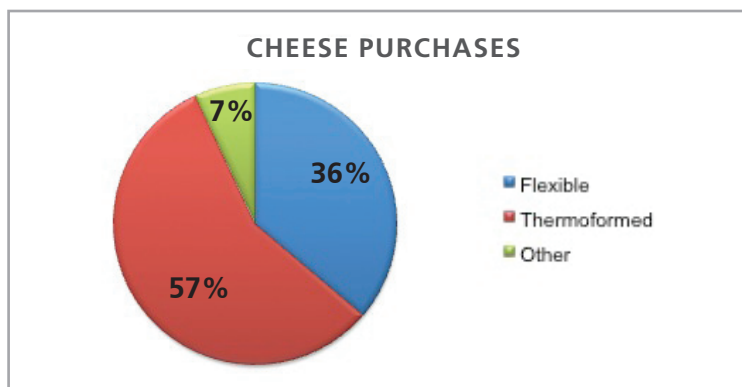
METRICS

The research team examined three primary metrics (purchase decision, total fixation duration, and time to first fixation) for this study in addition to qualitative measures recorded by the questionnaire. Further, the team developed heat maps and scan paths as data visualizations. The metric results and visualizations are detailed below.

Purchase Decisions

Purchase decisions (PD) – How many participants chose to buy the item

The below pie chart shows the percentage selection for the two choices of cheese packages tested. Purchase decision results show a strong preference for thermoformed type packages over flexible pouches.



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Eye Movement Analysis – TFD

Total fixation duration (TFD) – the time, in seconds, spent on average by participants fixating on this item. The higher the number, the better the package performed.

Fixation duration is typically one of the most important metrics for a consumer study. We found a strong correlation between product selection and fixation duration. That is, as a consumer's fixation duration increased, so did their chance of purchasing the item fixated. There was also a positive correlation between product selection and fixation count. The below plot shows a significantly longer duration of fixations, with participants spending over half a second longer looking at thermoformed cheese packages.



Eye Movement Analysis – TTFF

Time to first fixation (TTFF) – the time, in seconds, from when a product first enters a participant's field of view until they fixate on it. The lower the number the better the package performed.

First fixation helps us understand what packaging jumps off the shelf catching the participant's eye. The below plots show a significantly shorter time to first fixation for thermoformed packages—participants found it almost a second faster.



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Eye Movement Analysis – Heat Maps

Results of the eyetracking experiment can be visualized in aggregate via heat maps. A heat map shows where most participants looked by visualizing 'heat' in that area. The redder an area, the more fixations that area received relative to its surroundings. A heat map drawn from the entire participant pool is shown at right.



Eye Movement Analysis – Scan Paths

In addition to aggregate visualization, individual patterns can be observed. The image (right) is a representative scan path of an individual showing the dominance of the thermoformed package. In this visualization, you can see the sequence of fixations by the number in the dots, and the diameter of the dot is proportional to the length of fixation (i.e., larger dots indicate a participant fixated on a point for a longer period).



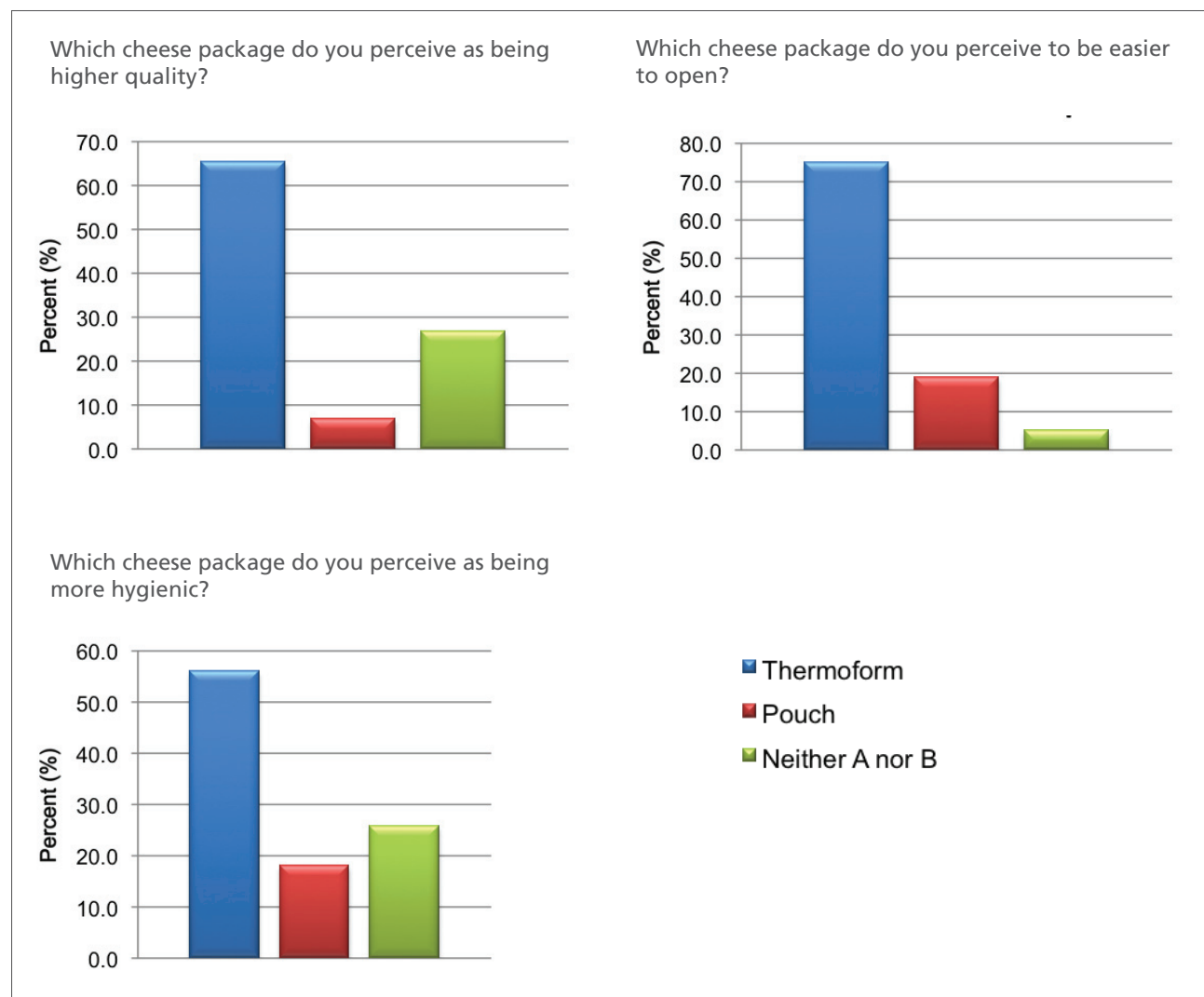
RELEVANT FINDINGS

This experiment resulted in a strong core finding with supporting statistics:

- Thermoformed cheese packaging was found to be more appealing, was viewed longer and found faster than flexible plastic packaging
- 24% longer fixation duration
- 42% more fixations
- 42% less time to first fixation
- 44% more purchases

Following the in-store eyetracking study, participants completed a post-survey. Results for several questions revealed the following perceptions of thermoformed vs. pouch cheese packaging:

- 65.5% perceived cheese packaged in a thermoformed package to be a higher quality
- 75% agreed that thermoformed cheese packages were perceived as easier to open
- 56% perceived the thermoformed cheese package as being more hygienic



This data, when combined with the above relevant findings, makes for compelling argument for why rigid thermoformed cheese packages are preferred over flexible pouches.

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