

# Delayed delivery at vending machines prompts healthier snack choices

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Credit: Rush University Medical Center

Delaying vending machines' delivery of tempting, high-calorie snacks can shift people's choices to less popular but healthier options, a first-of-its-kind, National Institutes of Health-funded study has found.

Preventive medicine specialists at Rush University Medical Center examined people's snacking behavior at work to see if a vending machine time delay or price discount could influence people to make better, healthier snack choices.

The results were published online in *Appetite*, an international research journal specializing in the influences on the selection and intake of foods and drinks.

## **Desire for immediate gratification**

"Having to wait for something makes it less desirable," said Brad Appelhans, Ph.D., a clinical psychologist at the Rush University Prevention Center and lead investigator of the study. "Research shows that humans strongly prefer immediate gratification, and this preference influences choices and behavior in daily life."

This behavior is known as delay discounting, which is the tendency to choose smaller immediate rewards over larger delayed rewards. "We wanted to see if we could use this preference for immediate gratification to improve people's vending machine snack choices," Appelhans said.

Vending [machines](#) are the most prevalent source of high-calorie snacks in the United States. There are 1.3 million snack vending machines across the U.S.

## **25 seconds was too long a wait for many**

For the study, Appelhans and his team at Rush developed a new vending machine and created a technology called the DISC system (Delays to Improve Snack Choices). The DISC vending machine system employs a "delay" bar that separates the healthier snacks from the less nutritious

options.

When an individual selects a less nutritious snack, the system begins a 25-second time delay before the machine releases the snack from the vending machine. It also has an LED screen, which displays the delay times for less [healthy snack](#) items, and a delivery countdown, which allows an individual to change their snack choice to a healthier option.

"This delay yielded a 2 percent to 5 percent increase in the proportion of total purchases from healthy snacks," Appelhans said. "Also, we found that the delay did not harm total sales volume or vending revenue, which is important to vending machine operators."

## **Time delays were as effective as discounts without harming revenues**

The study of the DISC vending machine system looked at the following six vending machine interventions in three locations between June 2015 and August 2016:

- No intervention
- 25-second time delay on less healthy snacks
- 25-cent discount on healthy snacks
- 25-cent tax on less healthy snacks
- 25-second time delay on less healthy snacks and 25-cent discount on healthier snacks
- 25-second time delay and 25-cent tax on less healthy snacks
- Healthy snack purchasing increased during the time delay as well as when the machines were set to 25-cent discounts for healthier options, or with a 25-cent additional tax on unhealthy snacks.

The study assessed a total of 32,019 vending sales in a cumulative 602

observation days.

"Our findings with the DISC vending machine system suggests that relatively brief time delays can nudge people to purchase healthier snacks at least some of the time. The beneficial effect on snack choice is about as large as that seen with discounts, but unlike discounts, time delays do not harm the total revenue of vending machines," Appelhans said.

"This could be a viable option for vending machine owners to offer good, healthy snack options while keeping their sales and avoiding out-of-pocket costs."

## **Study compared purchases among blue collar and white collar workers**

The DISC system color coded and labeled the healthy snacks to distinguish them from the regular, less healthy snack options. The machines also had clear signs indicating that regular, less healthy snacks would vend after a 25-second time delay. There was a touchscreen menu explaining the system delay mechanism and a countdown timer.

The researchers also had specific criteria for healthy snacks vs. regular snacks. Healthy snacks must meet five of the seven following criteria:

- Less than 250 calories per serving
- 35 percent or fewer calories from fat
- Less than 350 milligrams of sodium per serving
- No trans fats
- Less than 5 percent of daily value of saturated fat per serving
- More than 1 gram of dietary fiber per serving
- Less than 10 grams of added sugar per serving

The study also compared the sales of snack items based on the location of vending machines in areas frequented by blue-collar or white-collar workers. The study found that sales of healthy snacks even without the [time delay](#) and no intervention was significantly higher in vending machines in the white collar location, at 47.3 percent of sales, compared to the blue collar location, where healthy snacks accounted for 36.6 percent of purchases.

Also, the combination of a [delay](#) and price discount produced a larger improvement in healthy [snack](#) purchasing in the blue collar location than in the white collar location.

## **Vending machines 'are not going anywhere anytime soon'**

"There is a major need for new dietary intervention strategies that combat obesity-promoting factors in the environment," Appelhans said. "Obesity and poor diet are strong risk factors for heart disease, stroke and diabetes."

"Vending machines are conveniently located, have a broad reach and are the most prevalent source of high-calorie, nutrient-poor foods in the U.S.," Appelhans said. "They are not going anywhere any time soon, so this new vending machine system could be an effective and financially viable strategy that can shift individuals' choices towards healthier options."

Provided by Rush University Medical Center

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