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OKAYAMA
UNIVERSITY

Initiatives to reduce food loss and waste using AI/DX

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Overview of Food Waste Reduction Initiatives

Title of Campaign: NOKORI-FUKU Campaign

Nokori-fuku (literally leftover-good fortune) means:
Among those that were not chosen by others and remained until
the end, there remain the truly valuable and good ones.
Left over may be the unexpected good stuff.

What: Food waste reduction at department store, co-ops,
and supermarkets by

- 1) Promotion of discount food purchases
- 2) promotion of Temae-dori (pickup from the forefront)

Who: Okayama University organized

When: 3 times from 2022 to 2024; November in FY2024

Where: 2 department stores, 2 co-ops, and 3 supermarkets in
3 years

How: Live streaming of food corner using a web app &
Public awareness designed by Nudge theory

Campaign Flyer



Nudge Theory

1. Popular in the fields of behavioral economics and behavioral science
2. Proposes mechanisms and methods to encourage people to voluntarily choose desirable behaviors rather than by coercion
3. The four elements of Easy, Attractive, Social, and Timely have been identified as particularly effective measures, and are summarized in “EAST” Framework

Easy

An element
that makes it
easier to
take action

Attractive

An element
that makes
sustainable
choice
attractive

Social

An element
that
encourages
social
contribution
and
empathy

Timely

An element
that provides
information
at the right
time and
place

EAST Framework

Easy

1. Easy to grasp information on discounted products using a smartphone without visiting a store in person

An element that makes it easier to take action

Camera for Live Streaming



1. Broadcasted image



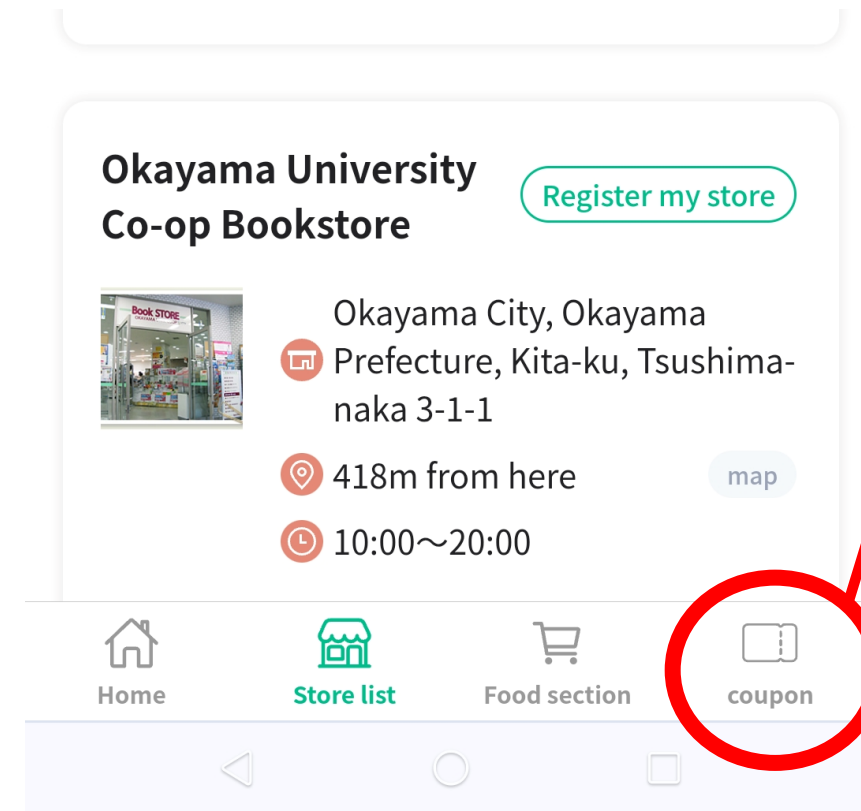
Attractive

1. One can buy food at a discount price
2. Receive 10-point reward for presenting a coupon

An element that makes sustainable choice attractive



1. High resolution broadcasted photo (every 5 minutes)



2. Web App Screen



3. Coupon

Social

An element that encourages social contribution and empathy

1. Contributing to food waste reduction
 - By purchasing discounted food products
 - By practicing Temae-dori
2. Supporting food banks by donating 10 yen through coupon use



学生川柳

割引で
心も財布も
ホックホク

岡山大学 一年生 焼きそば

Presenting student Senryu (short poem) to imply participation of university students and motivate empathy and participation by customers



学生川柳

すぐ食べる？

そんな時には

てまえどり

岡山大学 ミズキ

Timely

1. Getting the latest information at the right time when discounted products are on sale.
2. Raising awareness through educational POP near the target sales area.

An element that provides information at the right time and place

Price Tag Rail POP for "Tema-e-dori"



Aimed at raising awareness about food loss reduction and encouraging conscious decision-making when picking up products

Encouraging "Tema-e-dori"



Milk and Bread Section



Encouraging the Purchase of Discounted Food



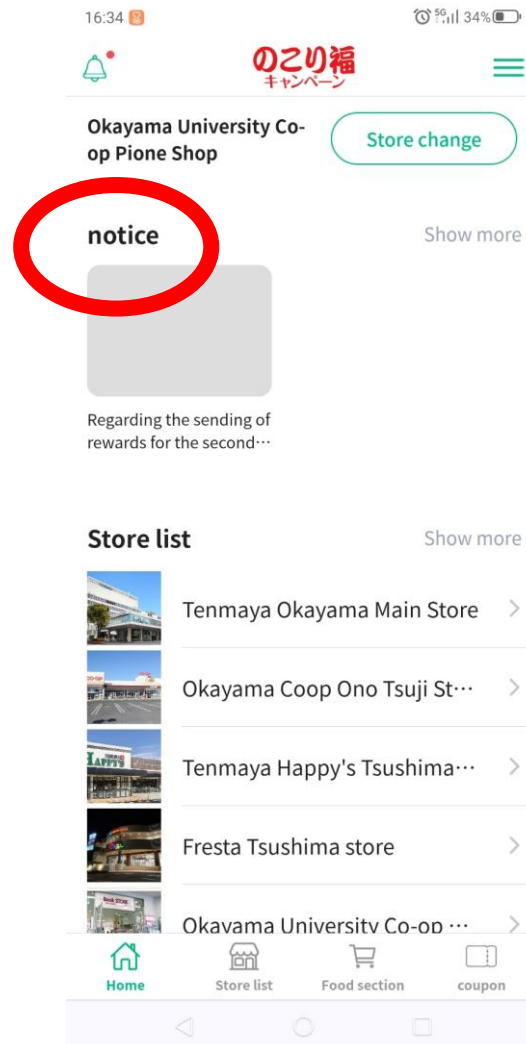
Prepared Foods and Fresh Fish Section, etc.



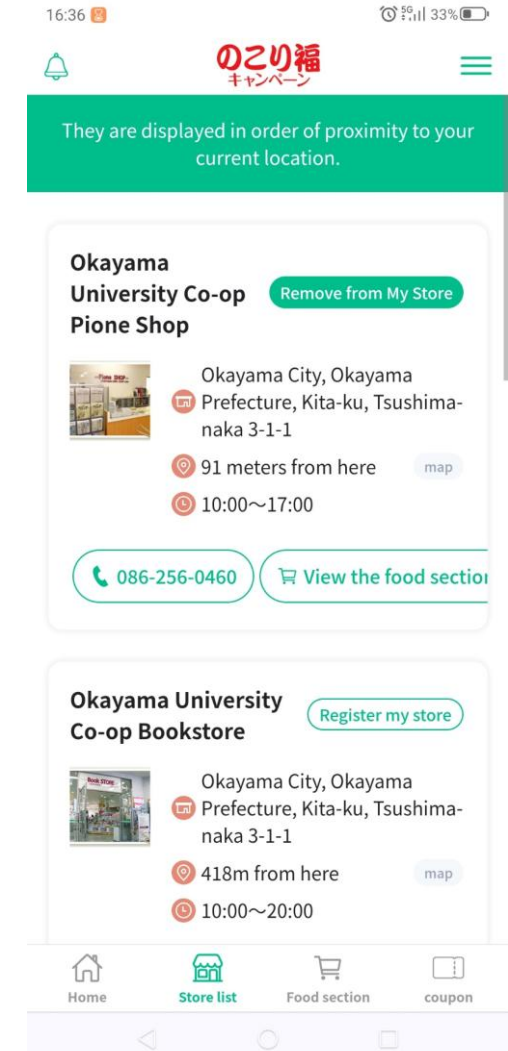
Timely

1. Getting the latest information at the right time when discounted products are on sale.
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An element that provides information at the right time and place



**UPDATE PICTURE
EVERY 5 MINUTES**



Timely

An element that provides information at the right time and place

1. Getting the latest information at the right time when discounted products are on sale.
2. Raising awareness through educational POP near the target sales area.

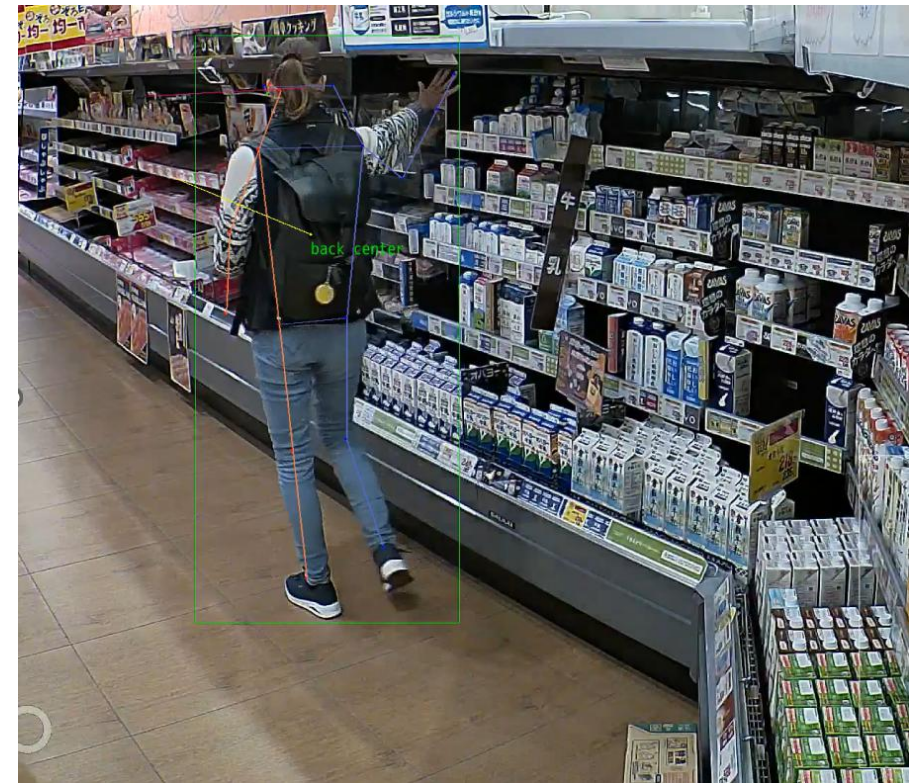


AI cameras for effect measurement of campaign (FUJITSU)



AI-based human flow analysis and attribute classification

Count traffic, measure length of stay in designated area, categorize gender and age group



AI motion analysis

Recognize motions from video, including expansion of hands

Installation of Digital Signage and AI Camera (TOPPAN)

Sushi corner



USB camera



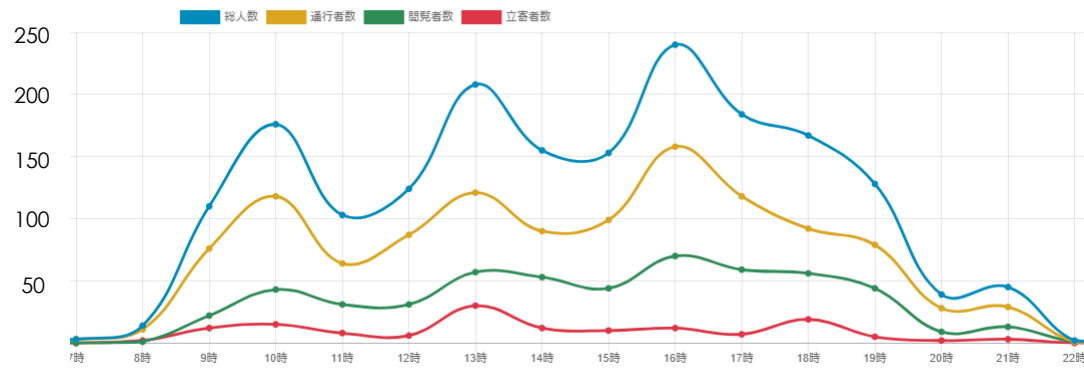
14" Signage

STB

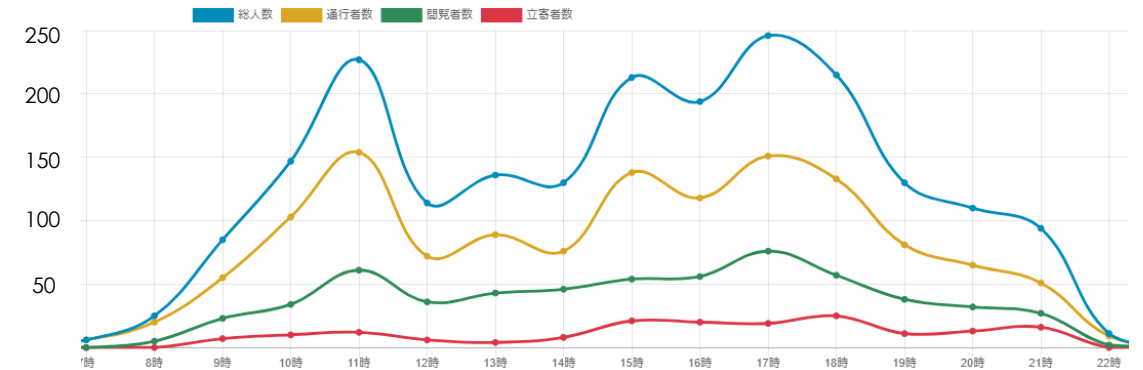
Example of AI analysis (TOPPAN)

Human Flow at Sushi corner

Before campaign 10/27(日)

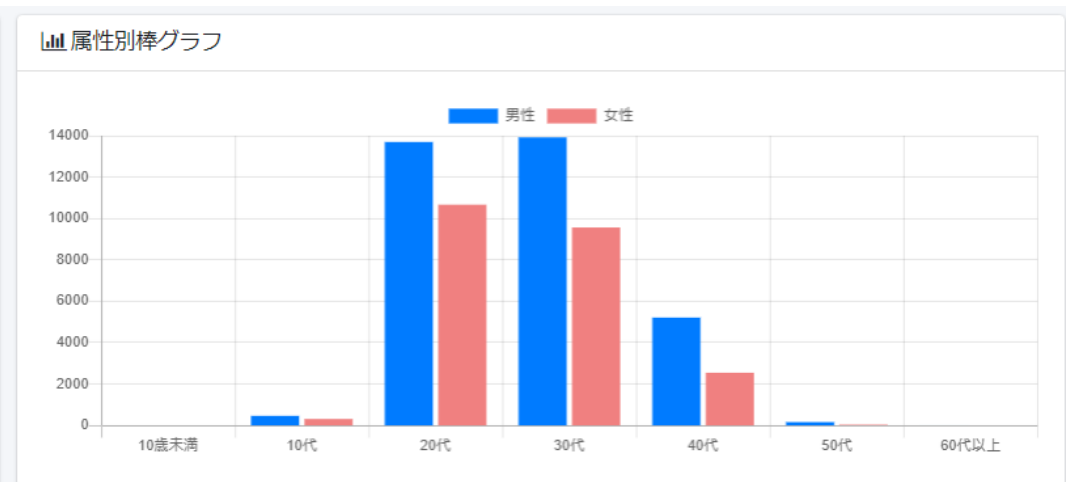
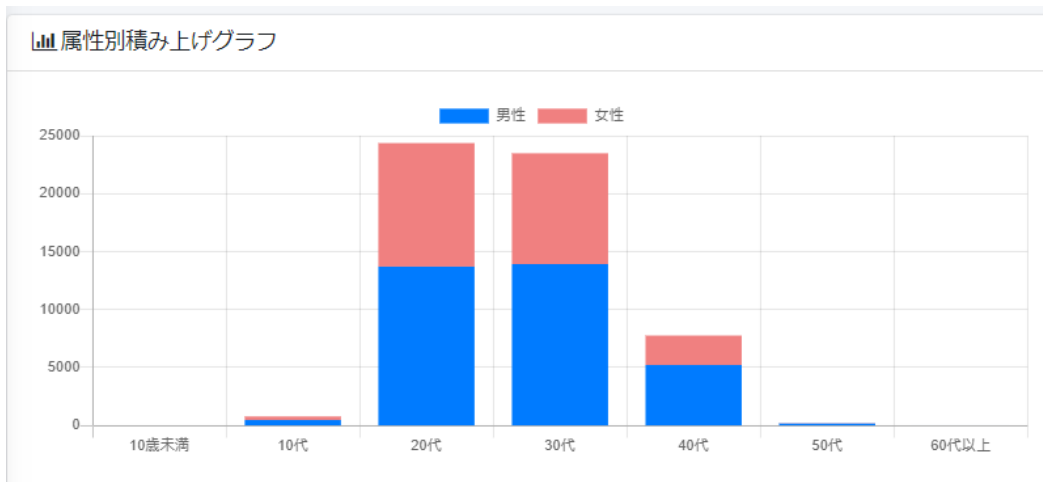
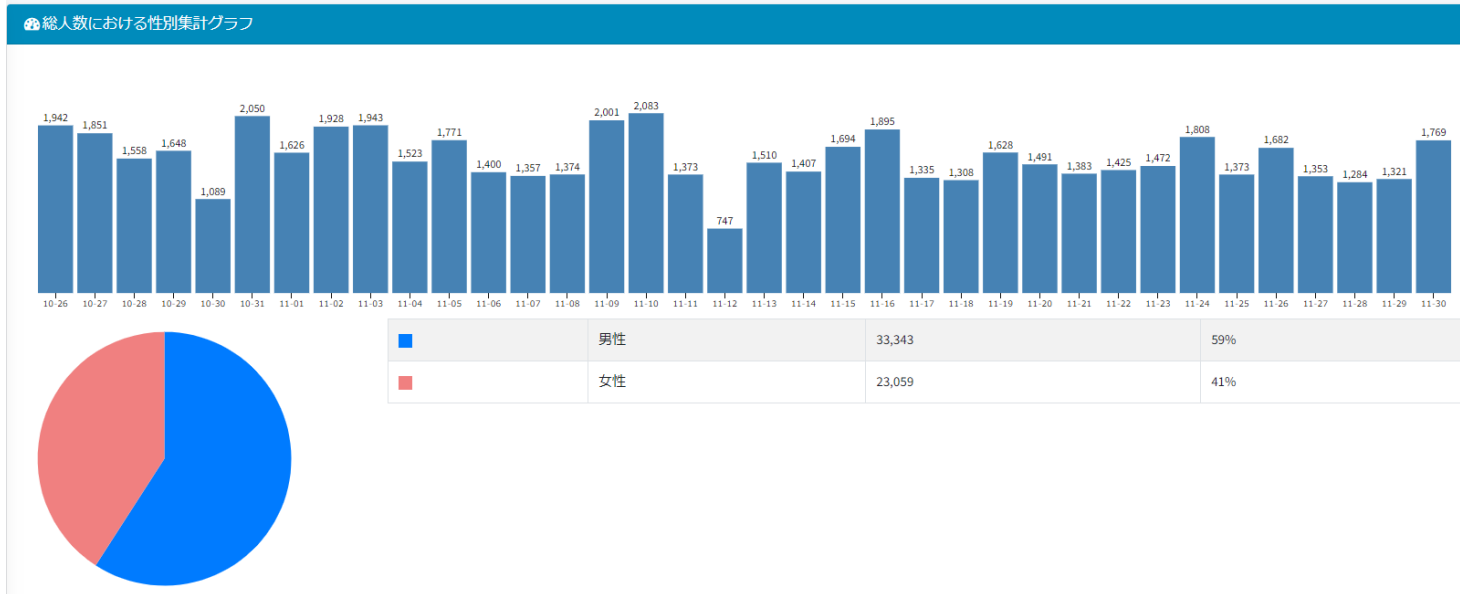


During Campaign 11/10(日)



Example of AI analysis (TOPPAN)

Breakdown of total customers at Sushi corner by gender and age group



AI discount system on food loss reduction (Sinops)

- The basic idea of AI discount system is to:
“Achieve sold-out at closing time and maximizing benefit by optimal discount at optimal time considering stock amount and expected sales amount increase by higher discount rate”
- In our case study, we implemented a simulation by AI-based dynamic discount system of sinops over a one-week period
- The predicted results indicated: the number of unsold items would drop from 55 pieces per week to zero
- Details will be explained by the next presentation from Sinops

Effect of campaign on food waste reduction

- Photos at closing time at Fresta Tsushima Store (October 9-18)
- Sold out at within the shooting area of Side dish on 17 out of 23 days of the campaign period



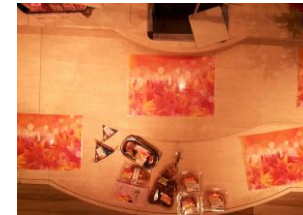
10/9の中継写真



10/10の中継写真



10/11の中継写真



10/12の中継写真



10/13の中継写真



10/14の中継写真



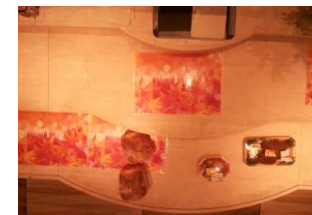
10/15の中継写真



10/16の中継写真



10/17の中継写真



10/18の中継写真

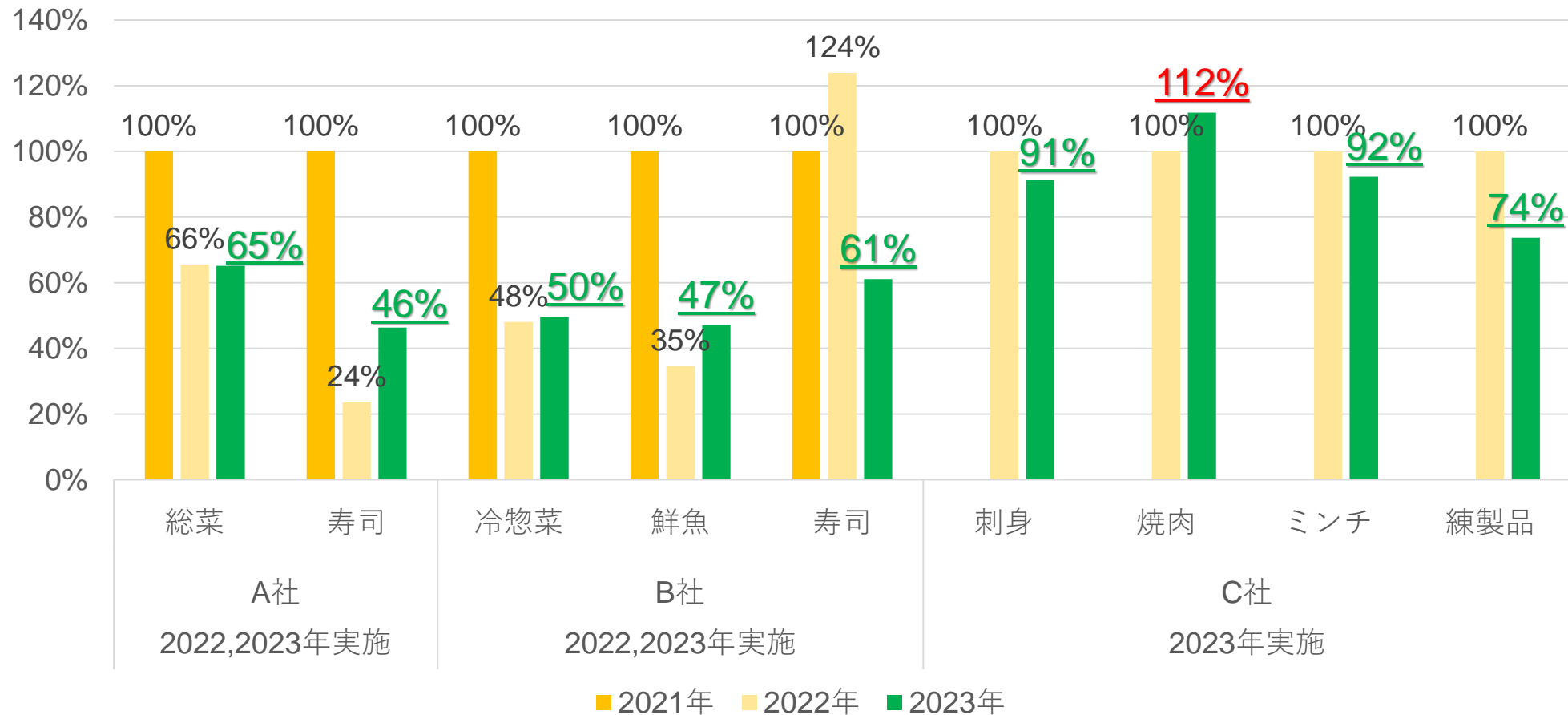
Waste reduction effect by campaign

Food loss reduction was found to be effective in the three companies for which data were available

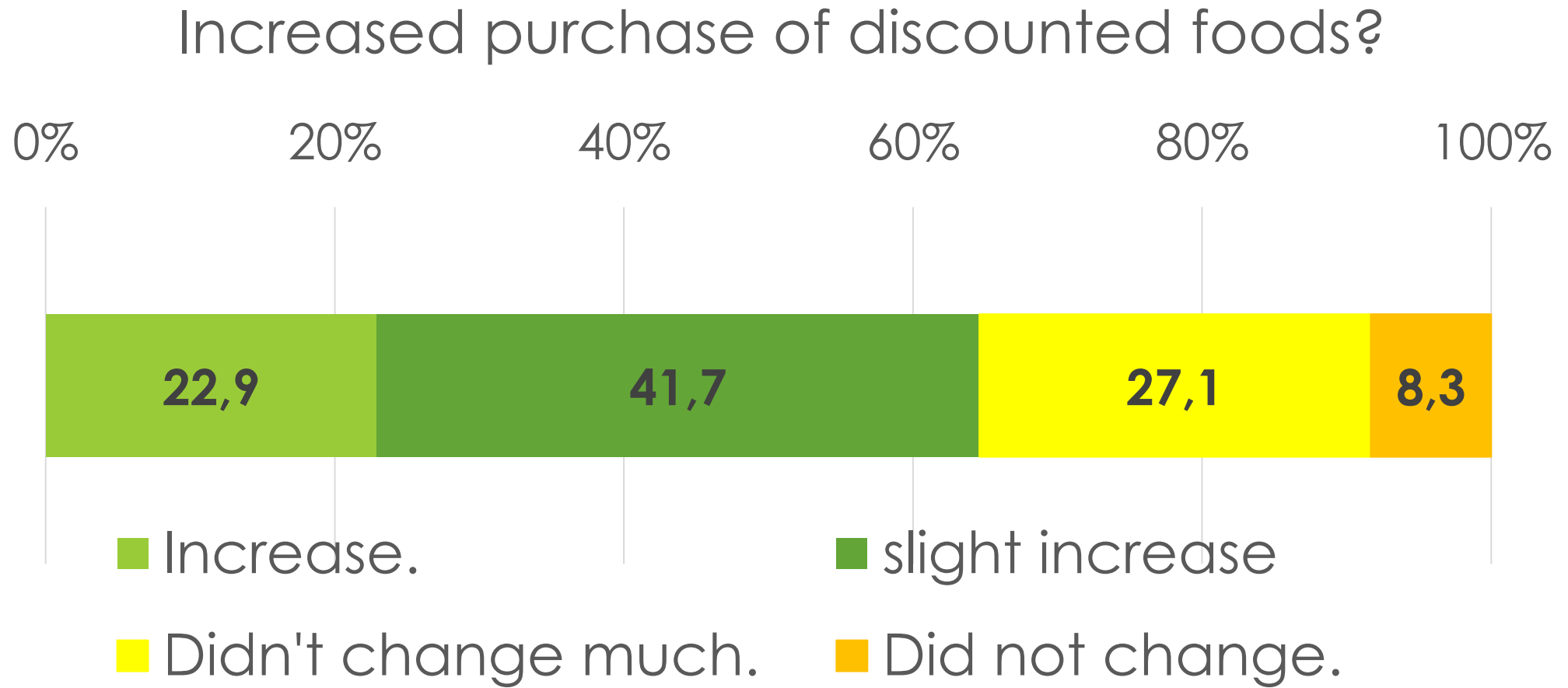
Company A: 35-54% reduction compared to October 2021

Company B: 39-53% reduction compared to October 2021

Company C: 8-26% reduction compared to October 2022 (except for beef)

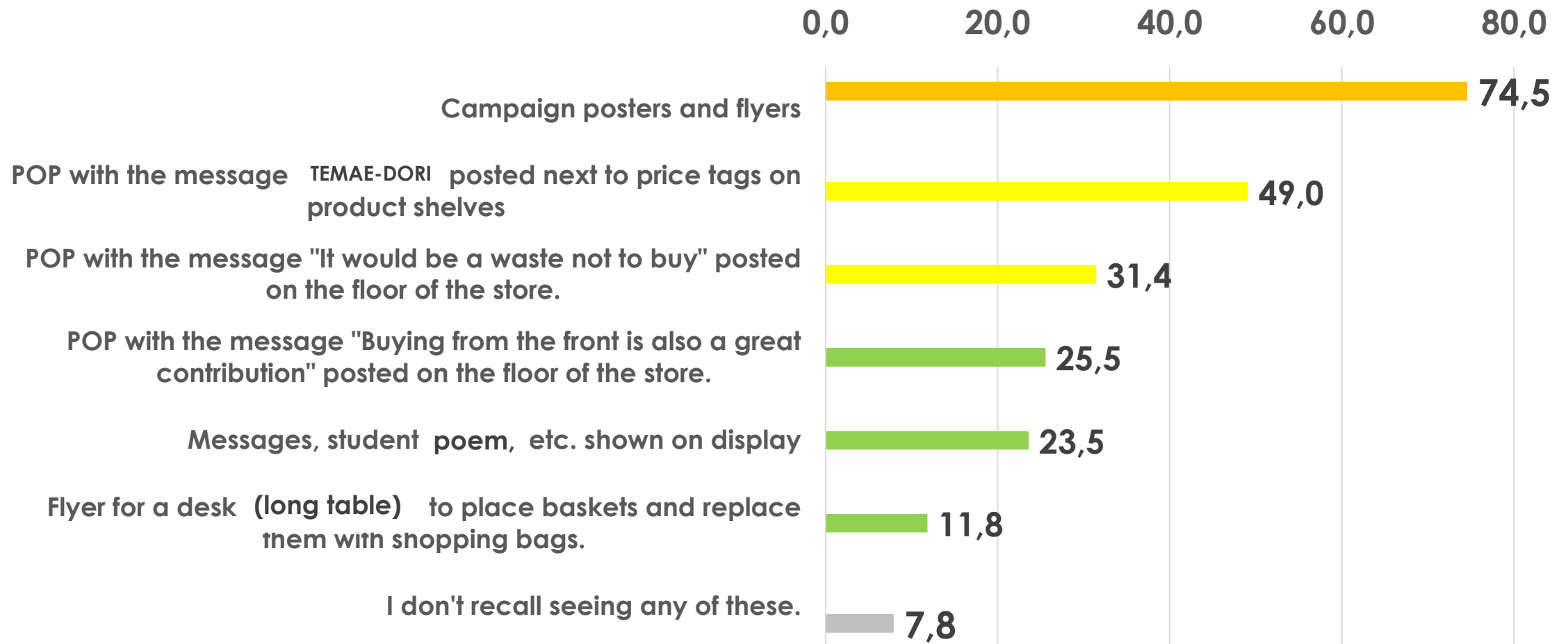


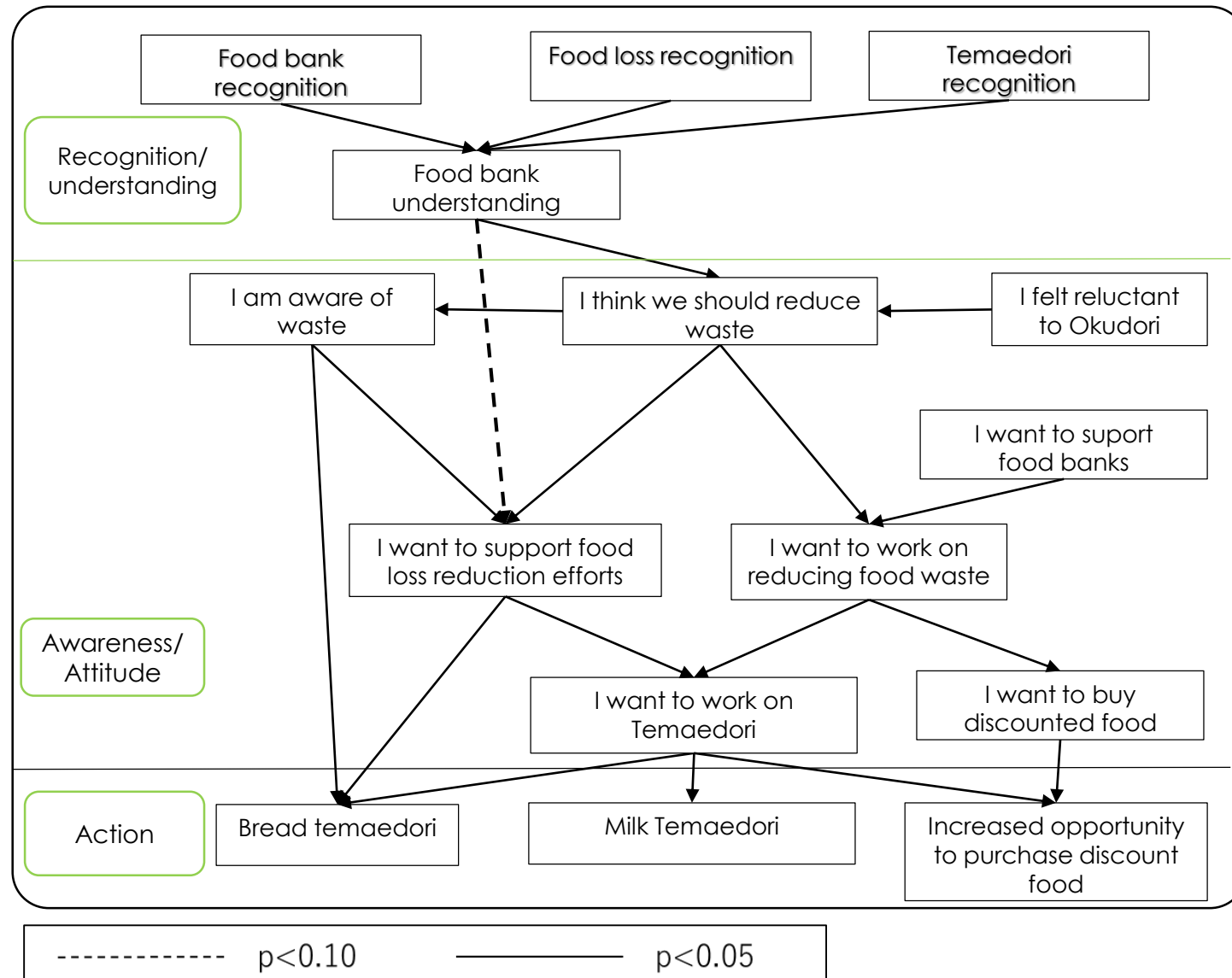
Food waste reduction effect based on survey before and after the campaign



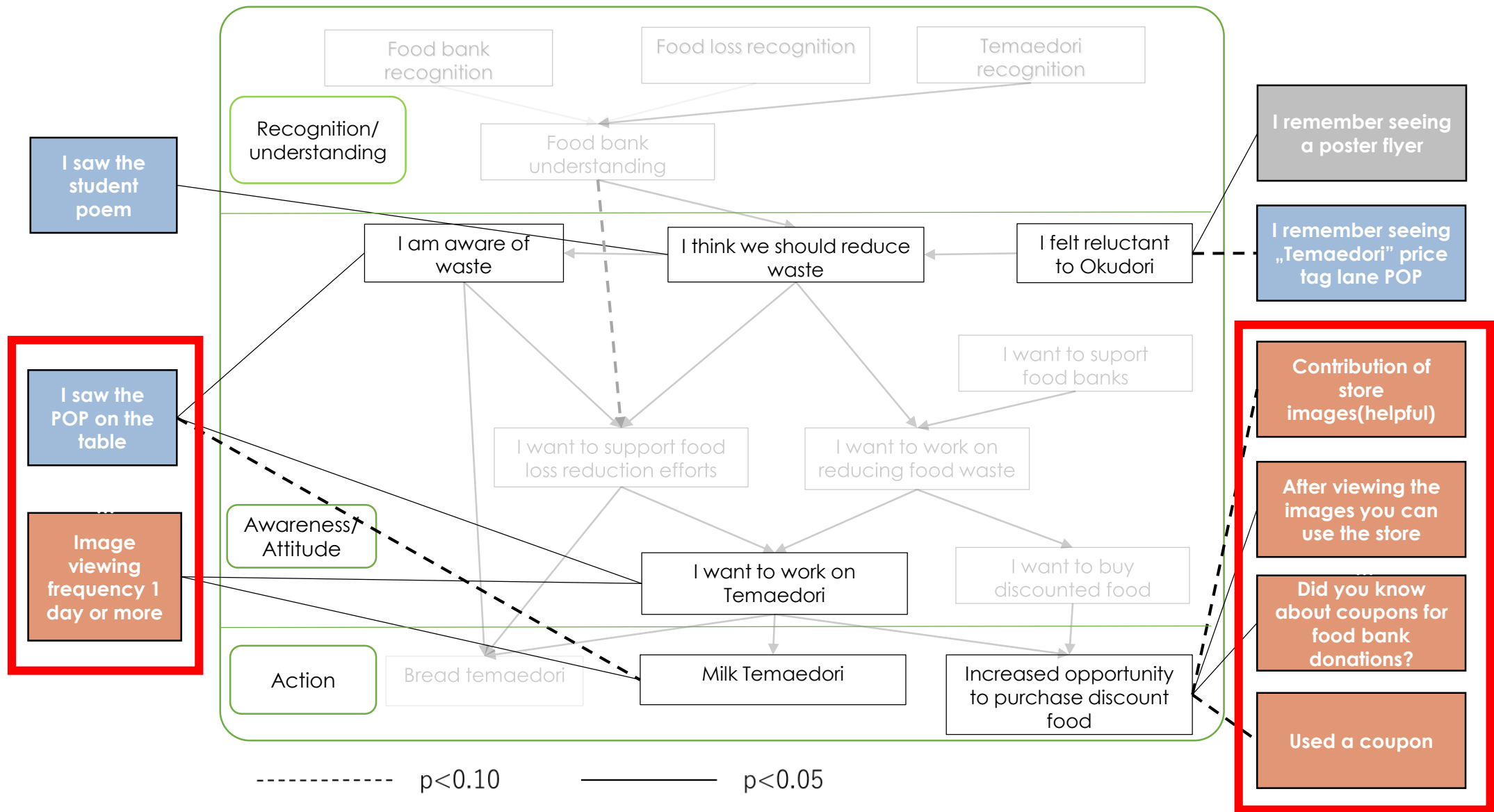
Educational materials effect based on survey after the campaign

Which posters, flyers, and educational POPs did you notice?

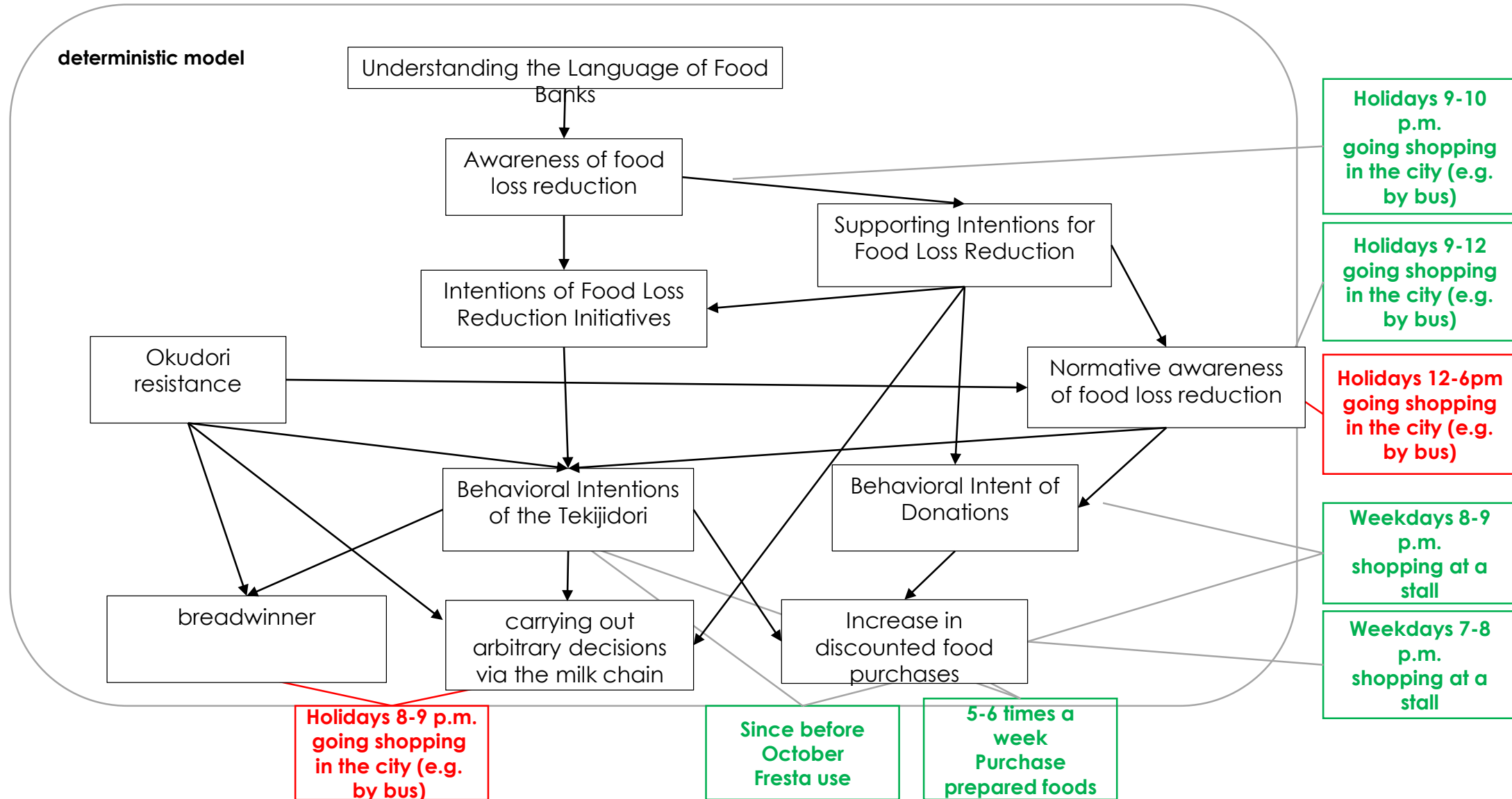




A model of determinants of food waste reduction behavior



Relationship between the stipulated causes and lifestyle, enlightenment, etc. Correlation analysis of determinants and shopping behavior



Conclusion

1. Nokori-fuku campaign achieved to reduce food waste by 35-54% in categories such as sushi and side dish.
2. The 2-phase questionnaire surveys before and after the campaign, as well as the analysis of the access log of the application, enabled to clarify the actual situation of food waste reduction behavior and its factor structure. The findings are expected to provide useful information for further consideration of the targets and methods of awareness-raising in the future.
3. The simulation of AI discounting system can be expected to significantly reduce food waste.
4. AI-based human flow and motion analysis could be utilized as a method for measuring the effectiveness of food waste reduction campaign.
5. The number of users in the campaign in 2024 is only about 200, and strengthening the framework for user acquisition and awareness-raising, including the use of SNS and geo-marketing, is an issue with high priority.
6. Food waste reduction is a common issue worldwide, and the bilateral joint project between Poland and Japan in this field is highly significant, and discussions on the formation of a project are desirable.



WARSAW
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OF LIFE SCIENCES



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THANK YOU

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HR EXCELLENCE IN RESEARCH

