

Reducing Expiring Food Wastage in Supermarkets: The Case for Reintegrate Centers and Food Web



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IPIIC 2021: International Physical Internet Conference

Why concentrate on Food Waste?

- **Loss of potential resource that has a societal impact**
- **Efficiently balancing the surplus with the increasing demand can help improve affordability**
- **Production of food has a large carbon and water footprint due to the intensive processing**

Understanding Supermarket Food Waste

Approximately **40% of food waste** is estimated to **occur in supermarkets**

Equivalent volumes is about **40 mn tonnes** in the US , **67 mn tonnes** in India

Sheer wastage of such volume can be pre-empted and used to feed a large population

Some causes contributing to wastage

High **display quantities** and high **visual packaging** standards

Lack of distinction between **various terminology** used in indicating expiry

Exposure to **e-commerce and globalisation** has exposed consumers to higher variety of products and higher service level expectations

Post pandemic, **new channels of distribution** with consumers seeking **lower prices**

Source: <https://www.timesnownews.com/business-economy/industry/article/world-food-day-2020-how-food-waste-aects-the-economy/667896>
<https://www.rts.com/resources/guides/food-waste-america/>

Consumer Survey

Conducted among customers of different age groups and professions in India through a qualitative survey

Factors considered

Shopping trends & purchase channels

Views on sub optimal foods

Brand loyalty vs price sensitivity

Purchasing frequency/ trends

Some Observed Trends

Customer preference for brand over store, and need for high service levels

Post pandemic shift towards e-commerce platforms, which was straining the supermarket supply chains

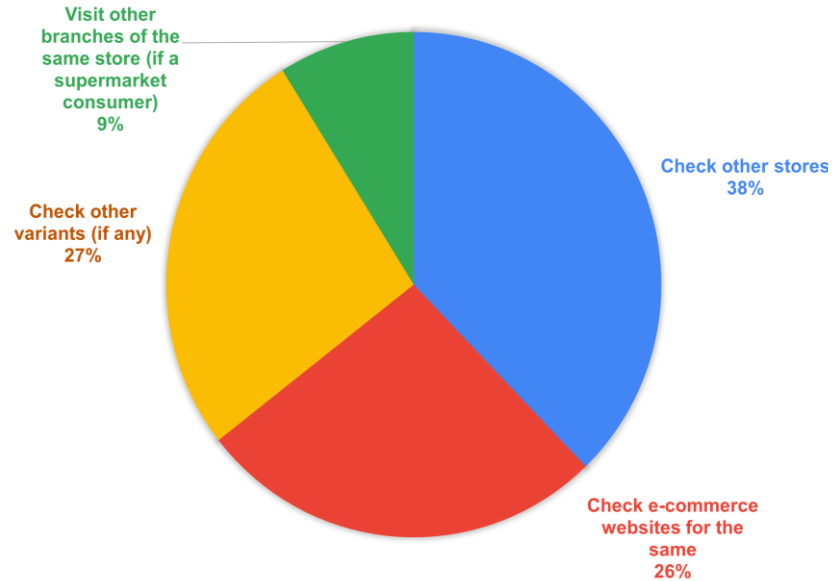
Customers chose products with later expiration to buffer for consumption delays

Most customers were not confident about purchasing discounted foods nearing expiring

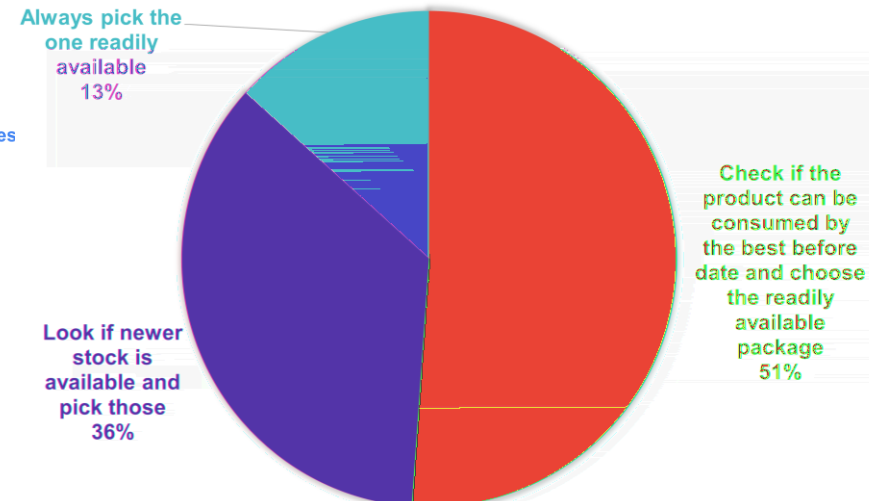
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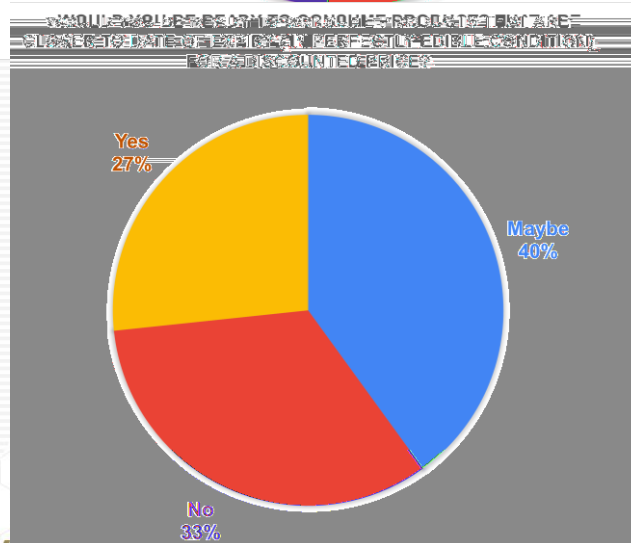
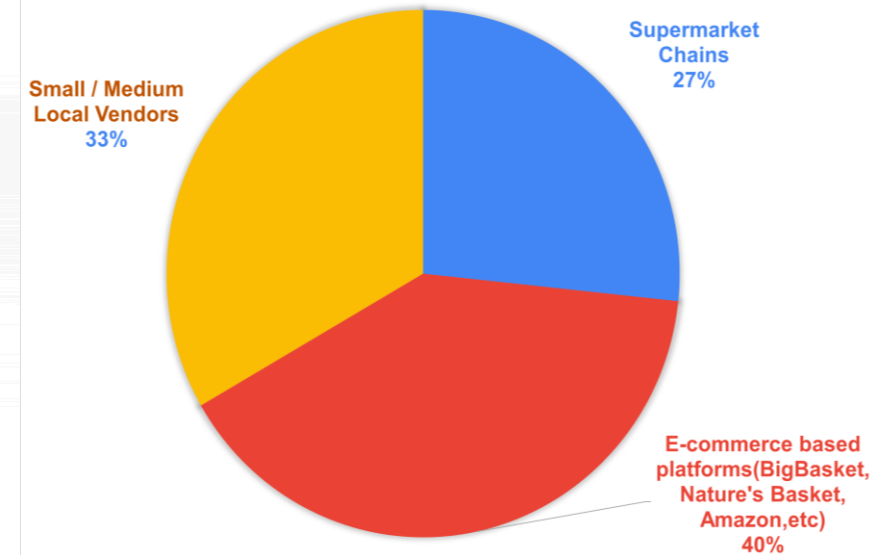
WHAT IS YOUR IMMEDIATE RESPONSE TO A PRODUCT THAT YOU REGULARLY CONSUMED NOT BEING AVAILABLE AT A STORE?



IN STORES, HOW DO YOU SELECT FOOD DISTRIBUTED AMONG DIFFERENT BATCHES?



WHERE DO YOU SHOP THE MOST POST THE PANDEMIC?



Current Practices and Shortcomings

- **Lack of traceability** of products post return to vendor
 - Risk of reentry to market with repackaging
- Inefficient **activity-based costing**
- Food is an **essential commodity** with great **disparity of distribution**
 - Especially in developing countries
- **Dynamic discounting** policies do not consider **impact of perishability** and **rate of spoilage**
- Diversion to the **non-profit organizations** is high **erratic**
 - Cannot be stabilized as streamlined demand

Proposed Solutions

Solution in Focus

- **ReIntegrate**, an aggregation and **Redistribution Centre** for goods closer to expiration

Complementary Practices

- Extended Barcoding / QR codes to Automate tracking
- Category Sensitive Discounting
- On Demand stocking for Premium Products

ReIntegrate Centers

Center (either Distribution/ Transit) to which the products which are due for expiry are redirected to be redistributed through different distribution channels

Functions of ReIntegrate Centers

Demand Levelling

Consolidating the trace demands that are unsatisfied due to economic factors, such as pricing concerns over a given region

Legal Stream of resale /safe disposal of expired products

lack of transparency of the reverse flow of these products post / shortly before expiry.

possibility of repackaging and reentry into distribution

Streamlining supply to non-profit organizations

Acts as centralized fulfilment centers to serve NGOs

Food Webs

stic networks for material and information distribution of a food supply chain



Managing the Costs

Inbound Costs : logistics expenses, quality checks and labor costs for storage.

Outbound Costs: transportation expenses to customers & labor costs in picking and packing.

Infrastructure costs: Fixed and Variable costs involved in maintenance and operation

Administrative expenses/information costs

Inbound Costs	Outbound Costs	Infrastructure/ Administrative Costs	Information Sourcing & costs

Challenges to Implementation

Additional Investments required for Construction, Infrastructure and maintenance

allocating investments for infrastructure, material handling and storage.

especially for stores where return to vendor is financially more favorable

Logistics and Delivery from ReIntegrate Centers

optimize logistics costs with use of good models such that outbound costs do not have a major negative impact

especially when NGOs handle outbound distribution

Lack of continuous flow of goods which justify employment/ facility utilization

By complementing the facility with another firm requiring stable labor, the uncertainty can be minimized.

Pricing Issues

Point of differentiation from retail hubs is pricing

Consistently providing sub-optimal foods at a lowered price should be favored over profit

Extended Barcoding / QR codes to Automate tracking

Manually tracking products due for expiry on a regular basis is highly labor intensive, especially in stores with higher stock.

Advantages of using Barcoding/QR codes

effectively groups together items that are due for expiry in a similar periods of time

forms an effective method to apply dynamic discounting

prevents expired products from being sent back into circulation with tampered packaging

bottleneck and slow-moving products can be identified with ease

shelving can be adjusted in accordance with sales

monitoring success rate of the FIFO rule

Category Sensitive Discounting

categorizing the items that are to be discounted and are due for expiry, based on various factors

Some Factors to consider

Average Shelf life

Days to Expiry

Stock on Hand due for sale from the batch due for expiry

Advantages of category sensitive discounting

The arbitrary scale can be adjusted to suit consumers & products

In regions with price sensitive consumers , demand sensitivity is greater to price fluctuations

Discounting places weightage on critical factors such as days to expiry and total stock and on rate of perishability

Price Sensitive Discounting

categorizing the items that are not sold and are due for expiry, price sensitive consumers can be

On Demand Stocking

ordering premium products on an on-demand basis
stocking of products with high novelty, but low market demand can be avoided
products/ luxury food items often have a lower rate of consumption
create a platform for reserving premium products
transport from the DC on a case-to-case basis

Conclusion

explore the possibility of aggregation & redistribution center ReIntegrate
introduced some complementary practices to help uniform distribution of food
resources

Requires considerable effort both monetary and infrastructure for
implementation

A greater emphasis on sustainable packaging & transparency in food supply
chains will go a long way

Hoping our efforts will culminate in reducing hunger, which is our ultimate goal!

Thank You!