

Packalicious – Inspirational knowledge session

Consumer acceptance of (more) sustainable packaging innovations

Lise Magnier

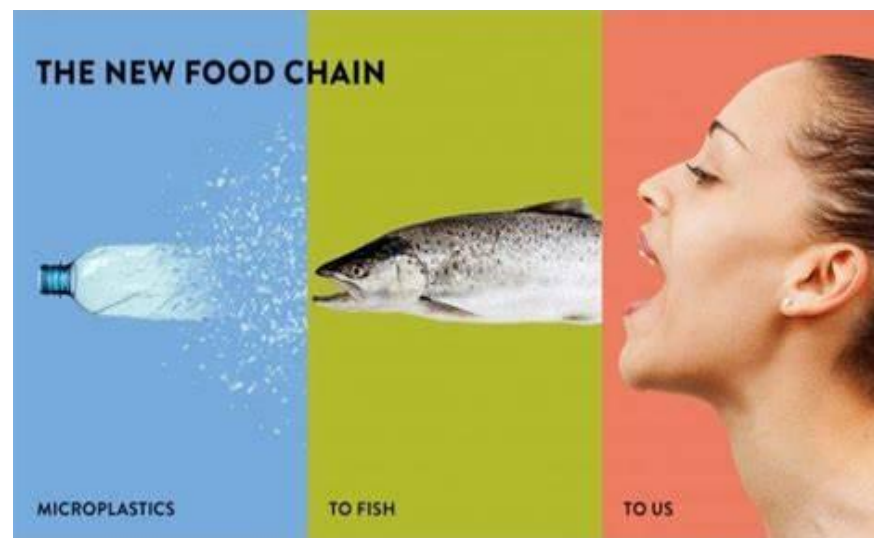
Associate Professor of Design for Sustainable Behaviour Change

Faculty of Industrial Design Engineering



It is not only about emissions and environmental pollution

- Health hazard for humans and animals









Bioaccumulation of microplastics in decedent human brains

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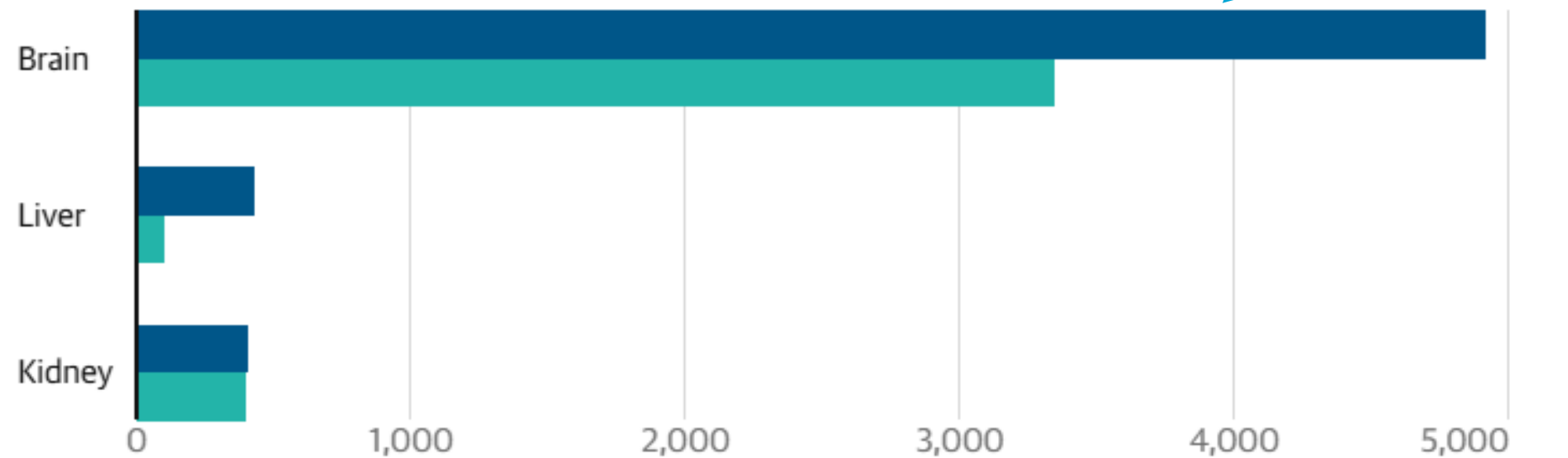
 Check for updates

Alexander J. Nihart ^{1,12}, Marcus A. Garcia^{1,12}, Eliane El Hayek ^{1,12}, Rui Liu¹, Marian Olewine¹, Josiah D. Kingston¹, Eliseo F. Castillo², Rama R. Gullapalli³, Tamara Howard⁴, Barry Bleske⁵, Justin Scott ⁶, Jorge Gonzalez-Estrella ⁶, Jessica M. Gross ⁷, Michael Spilde⁸, Natalie L. Adolphi⁹, Daniel F. Gallego⁹, Heather S. Jarrell⁹, Gabrielle Dvorscak⁹, Maria E. Zuluaga-Ruiz¹⁰, Andrew B. West ¹¹ & Matthew J. Campen ¹ 

Microplastic levels in brain samples increased from 2016 to 2024

Micrograms of plastic per gram of tissue, median

■ 2024 ■ 2016



Guardian graphic. Source: Nihart et al, Nature Medicine, 2025

How do food companies see consumers regarding sustainable packaging

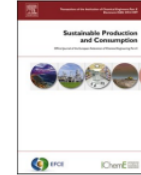
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Company views of consumers regarding sustainable packaging

Carsten Herbes^a, Ellen Mielinger^b, Victoria Krauter^{c,*}, Elena Arranz^{d,e},
Rosa María Cámara Hurtado^d, Begonya Marcos^f, Fátima Poças^g, Salvador Ruiz de Maya^h,
Ramona Weinrich^b

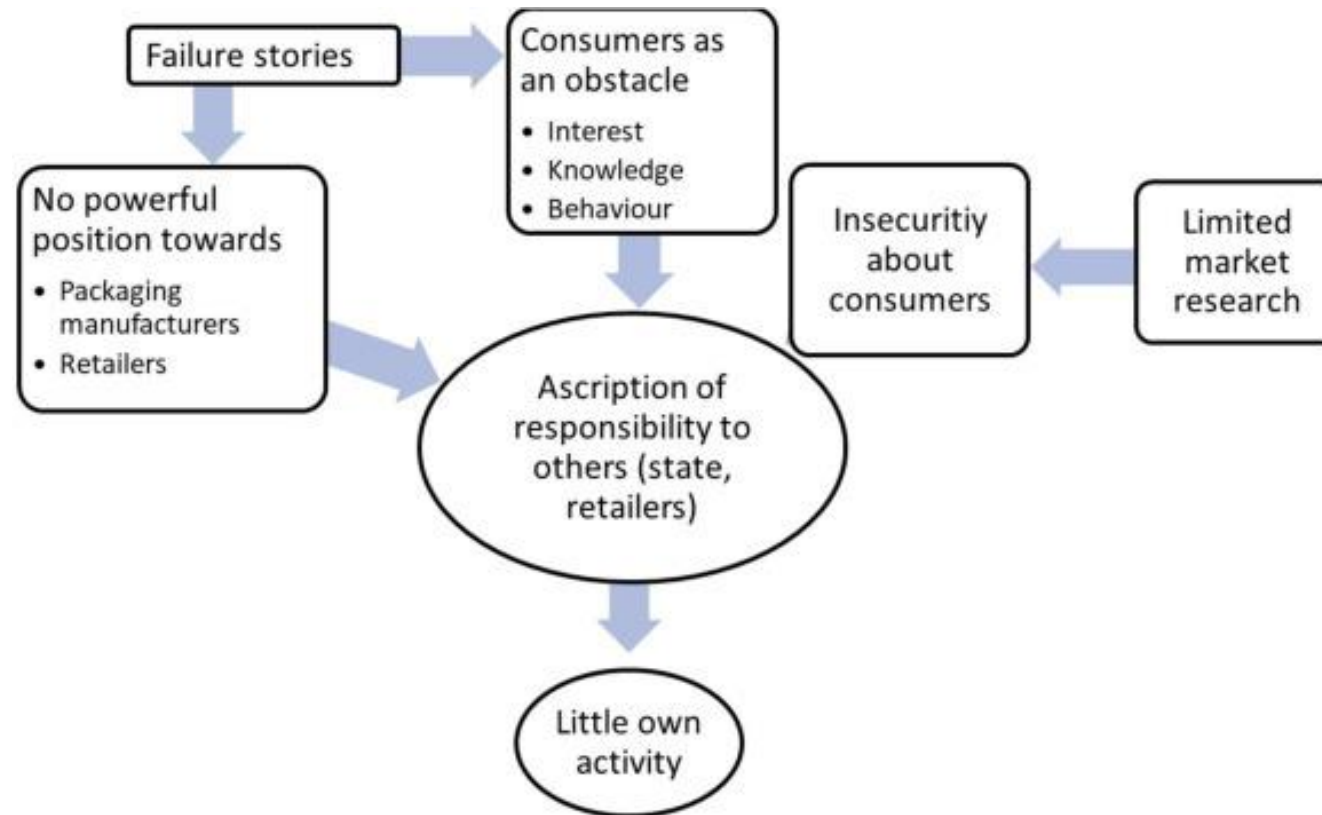
- qualitative interviews with 19 packaging professionals from food companies in Germany, Austria, Spain, and Portugal

How do food companies see consumers regarding sustainable packaging

- ½ of the interviewees think that sustainability in packaging does not matter to consumers.
- scant awareness of consumer research which shows that bio-based materials, biodegradability and recycled materials matter to consumers.
- belief that consumers pay more attention to attributes related to raw materials, i.e. the beginning of the packaging life cycle, preferring paper and rejecting plastics.

How do food companies see consumers regarding sustainable packaging?

Frequently criticized consumers, presenting narratives of disempowerment whereby responsibility for sustainable packaging is not on food producers' side.



Majority was negative or neutral on the importance of sustainable packaging for consumers

Consumers **knowledge** on sustainable packaging is low, particularly on the relative environmental friendliness of packaging materials, on recycling and waste separation.

Consumers' **attitude-behavior-gap** with regard to sustainable packaging // not buying eco-friendly packaging

Consumers practice wrong waste separation

Product attributes are more important than eco-friendly packaging (Ketelsen et al., 2020), but the results on WTP for sustainable packaging show that it must have importance for consumers (Prakash and Pathak, 2017; Hao et al., 2019; Ketelsen et al., 2020)

Knowledge on eco-friendly packaging is limited (Hao et al., 2019)
Bio-based = not well understood / confounded with biodegradable (Sijtsema et al., 2016)
Biodegradable is also often misunderstood (Allison et al., 2021)
Lack of knowledge on recycling procedures (Norton et al., 2022) / the relative environmental friendliness of different packaging materials (Norton et al., 2022; Steenis et al. 2017)

The attitude-behavior-gap has been pointed out frequently by past studies for sustainable products (Munro et al., 2023; Dieli et al., 2024) => limited amount of field studies

- Consumers are **uncertain** how to sort various types of food packaging (Nemat et al., 2020) which inevitably **leads to wrong sorting** (Mielinger and Weinrich, 2024)

Very few attributes pertaining to packaging material dominates consumer sustainability evaluation of packaging

Consumers consider a much wider set of attributes than suggested by the interviewees:

- Reused (Herbes et al., 2018)
- Made from recycled material (Jerzyk, 2016; Herbes et al., 2018)
- Made from renewable material (Herbes et al., 2018; Norton et al., 2022)
- Reusable (Scott and Vigar-Ellis, 2014; Herbes et al., 2018; Nguyen et al., 2020)
- Biodegradable (Scott and Vigar-Ellis, 2014; Jerzyk, 2016; Nguyen et al., 2020)
- Non-toxic / safe for human health (Jerzyk, 2016; Nguyen et al., 2020)
- Non-harmful (Scott and Vigar-Ellis, 2014)
- Eco-friendly production (Scott and Vigar-Ellis, 2014; Nguyen et al., 2020; Norton et al., 2022)
- Production using renewable energy (Jerzyk, 2016)
- Local production (Herbes et al., 2018)
- Fair production (Herbes et al., 2018)
- Shelf life (Norton et al., 2022)
- Lightweight and space-saving (transport and use) (Herbes et al., 2018)

Consumers see paper as sustainable

This perception is supported by past studies (Lindh et al., 2016; Nguyen et al., 2020)

Consumers see plastic as not sustainable

This perception is supported by past studies (Lindh et al., 2016)

Consumers see recyclability as an important attribute

This perception is supported by past studies (Scott and Vigar-Ellis, 2014; Lindh et al., 2016; Herbes et al., 2018)

Consumers see no / less packaging as an important attribute

This perception is supported by past studies (Scott and Vigar-Ellis, 2014; Lindh et al., 2016; Herbes et al., 2018)

A call to work iteratively with a positive mindset keeping an eye on what needs to be achieved.









Reusable packaging vs. Single-use packaging

- **Benefits:** Environmental benefits, Anticipated conscience, and Enjoyment
- **Risks:** Complexity (Refill & Return) and Contamination risk (Refill). But both are at a low level.
- Consumers have **high intention to purchase** reusable packaging

	1. Disposable	2. Refillable	3. Returnable	Statistics
Environmental benefits	3.83 (1.59)	6.08 (1.07)	5.98 (0.96)	H(2)=93.869***
Anticipated conscience	4.13 (1.43)	5.69 (1.20)	5.64 (1.14)	F(2,245)=44.331***
Enjoyment	4.03 (1.34)	4.69 (1.56)	4.84 (1.30)	F(2,245)=9.177***
Contamination risk	2.11 (1.08)	2.50 (1.44)	1.80 (0.90)	H(2)=9.625***
Performance risk	2.35 (1.16)	2.51 (1.38)	2.17 (1.00)	H(2)=1.469
Complexity	1.47 (0.72)	2.07 (1.06)	1.80 (0.95)	H(2)=24.241***
Purchase intention	4.35 (1.55)	5.16 (1.73)	5.17 (1.65)	F(2,245)=7.618***

7-point Likert scales

Means are displayed, SD deviations into brackets

Types of packaging	Disposable packaging	Refillable packaging system	Returnable packaging system
 <p>Stimuli 1: Shampoo</p>	 <p>Condition 1: Disposable packaging for shampoo</p>	 <p>Condition 2: Refillable packaging system for shampoo</p>	 <p>Condition 3: Returnable packaging system for shampoo</p>
 <p>Stimuli 2: Ketchup</p>	 <p>Condition 4: Disposable packaging for ketchup</p>	 <p>Condition 5: Refillable packaging system for ketchup</p>	 <p>Condition 6: Returnable packaging system for ketchup</p>

Reusable packaging vs. Single-use packaging

- Enhances the **perceived healthiness** and **quality** of the product.
- Is perceived as more **eco-friendly**
- Increases **contamination perception**, but still remains a very low level
- Is highly recommended



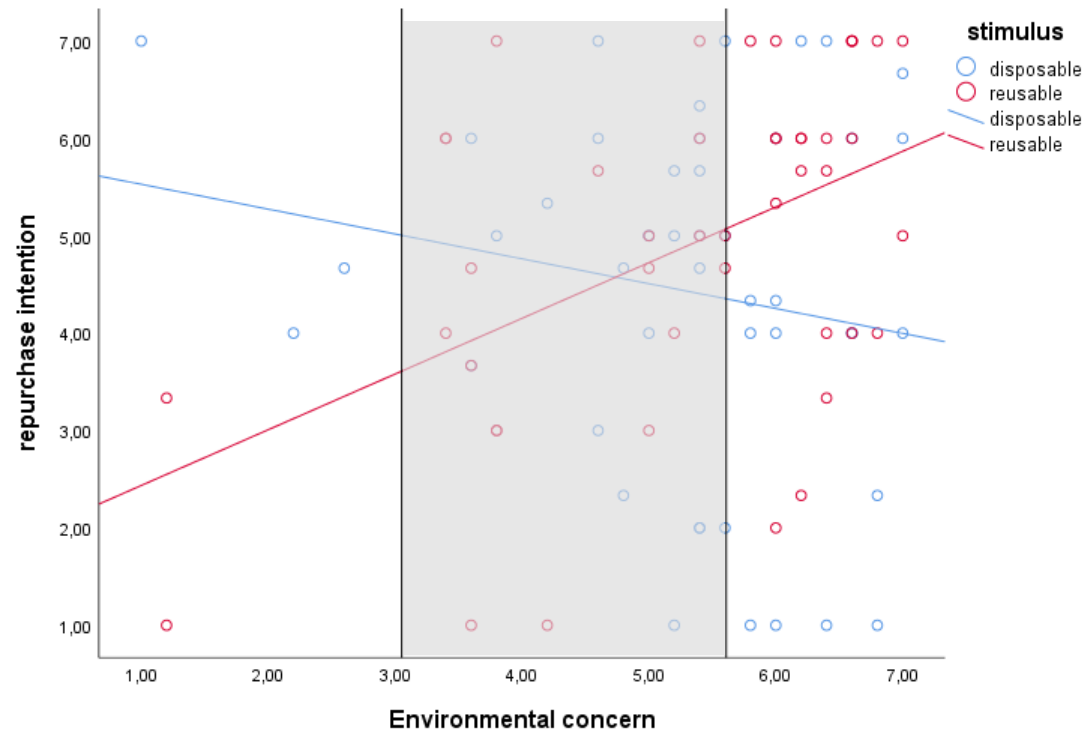
Single-use



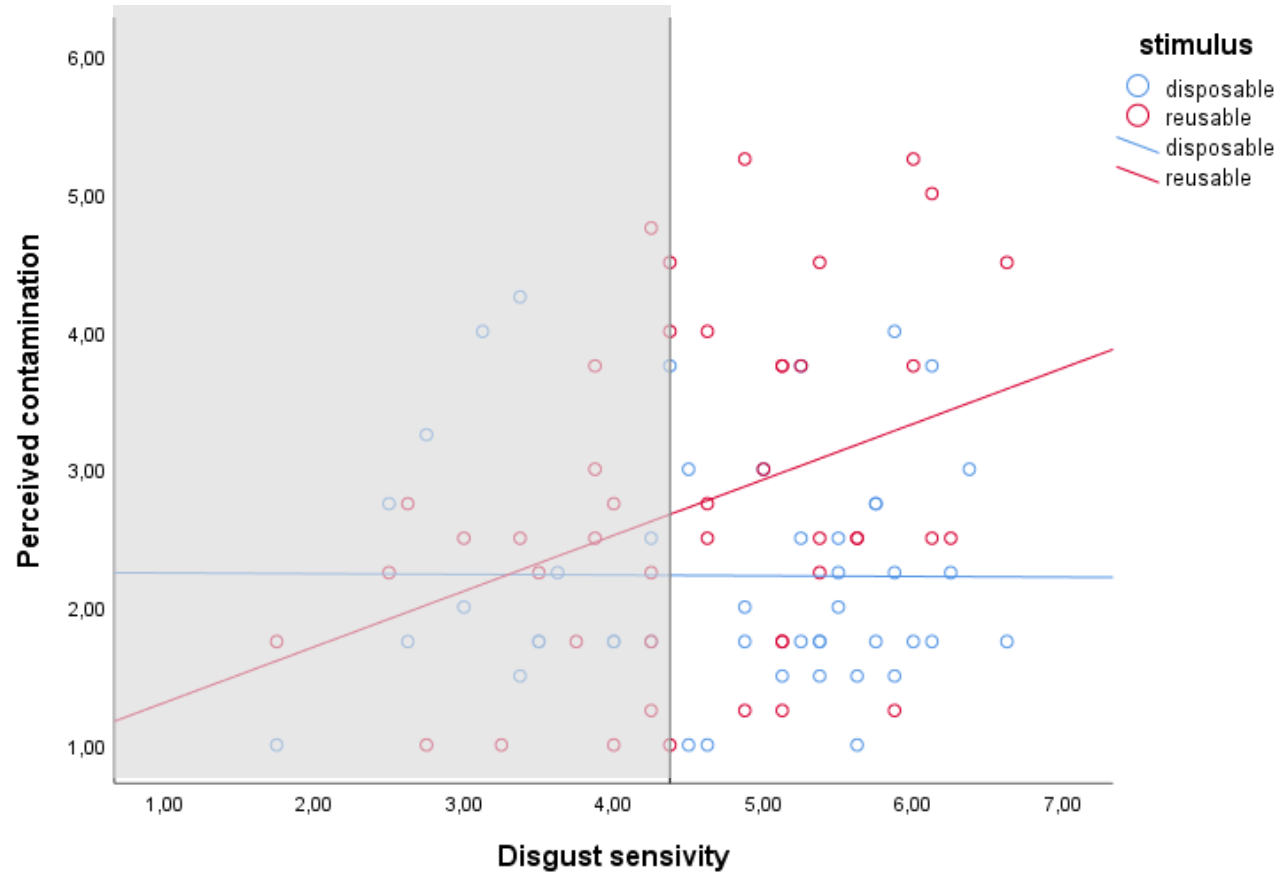
Reusable

	Disposable packaging	Returnable packaging
Attitude	4.82 (1.32)	5.56 (1.19) **
Healthiness	4.72 (1.51)	5.40 (1.32) *
Quality	4.45 (1.31)	5.13 (0.85) **
Packaging eco-friendliness	3.76 (1.66)	6.08 (1.11) ***
Contamination perception	2.23 (0.86)	2.76 (1.23) *
Safety concerns	5.85 (1.16)	5.66 (1.17)
Packaging attractiveness	4.66 (1.36)	5.11 (1.27)
Repurchase intention	4.43 (1.84)	4.89 (1.75)
Intention to recommend	4.10 (1.37)	5.06 (1.45) **
***p<.001; **p<.01; *p<.05		

Behaviours dependent on environmental concern



Perceived contamination depends on disgust sensitivity



Reusable packaging: Neat vs. Dented

- Positive evaluations tend to decrease when reusable packaging is damaged
- Dented packaging triggers **safety concerns**
- **Packaging attractiveness** largely decreases when reusable packaging is damaged



Neat

Dented

	Neat packaging	Dented packaging
Attitude	5.36 (1.70)	4.29 (1.63) ***
Healthiness	4.21 (1.09)	3.83 (0.80)
Quality	5.21 (1.04)	4.53 (1.03) ***
Packaging eco-friendliness	5.77 (1.26)	5.70 (1.16)
Contamination perception	2.84 (1.25)	3.67 (1.16) ***
Safety concerns	5.38 (1.55)	4.73 (1.52) *
Packaging attractiveness	5.40 (1.37)	3.78 (1.37) ***
Repurchase intention	4.85 (1.86)	4.41 (1.79) †
Intention to recommend	4.99 (1.74)	4.38 (1.75) *
***p<.001; **p<.01; *p<.05; †p<.10		

dents



scratches

Reusable packaging systems: General responses

Switching to reuse? An exploration of consumers' perceptions and behaviour towards reusable packaging systems

Xueqing Miao^{a,*}, Lise Magnier^a, Ruth Mugge^{a,b}

^a Faculty of Industrial Design Engineering, Delft University of Technology, Landbergstraat 15, Delft, 2628CE, The Netherlands

^b Amsterdam Business School, University of Amsterdam, Plantage Muidergracht 12, Amsterdam, 1018TV, The Netherlands



Reusable packaging systems: Enablers and Barriers

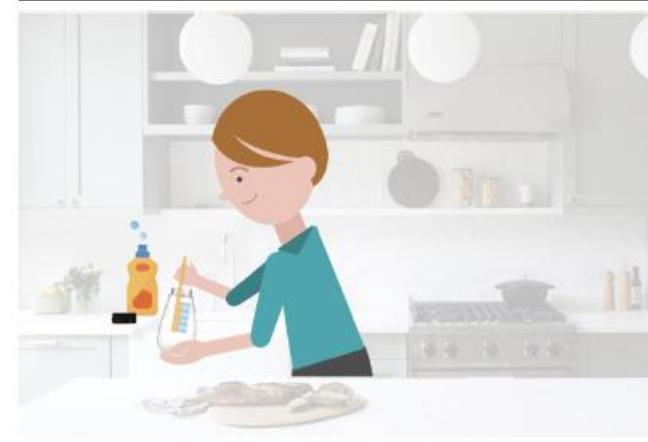
Pre-purchase evaluation (Intention to use for the first time)



System usage (In-store operation)



Post-purchase behaviour (Usage at home and decision to reuse)



ENABLERS

- **Economic incentives** are expected
- **Hygienic standard** is trustworthy
- **Environmental values** are recognized
- **Familiarity** with reuse practice

BARRIERS

- **The price** is perceived higher
- **Contamination** concerns emerge in different stages
- **Environmental impact** is vague
- **Complexity** of using a new system

Reusable packaging systems

Switching to reuse? An exploration of consumers' perceptions and behaviour towards reusable packaging systems

Xueqing Miao^{a,*}, Lise Magnier^a, Ruth Mugge^{a,b}

^a Faculty of Industrial Design Engineering, Delft University of Technology, Landbergstraat 15, Delft, 2628CE, The Netherlands

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- Consumers do not seem to be fully aware that the number of use cycles is the most crucial point for reusable packaging to reach sustainability **“Break-even point”**



Reusable packaging: Break-even points (e-BEPs)

Circular Economy and Sustainability
<https://doi.org/10.1007/s43615-024-00437-8>

ORIGINAL PAPER



How Many Times Should I Use My Reusable Packaging? Exploring the Role of an Environmental Break-Even Point in Shaping Consumers' Intention to Reuse

Xueqing Miao¹ · Lise Magnier¹ · Ruth Mugge^{1,2}



sunrice
JASMINE RICE

This packaging is reusable.
It will have a lower environmental impact
than single-use packages after being
reused **5 times**.

Price	per kg	Weight (kg)
2,15	3,90	0,550

Best before
30.05.2024

per portion (75g)
269 kcal
1141 kJ
100 g:
355 kcal
1507 kJ

0 705632 086943 >

sunrice
JASMINE RICE

This packaging is reusable.
It will have a lower environmental impact
than single-use packages after being
reused **45 times**.

Price	per kg	Weight (kg)
2,15	3,90	0,550

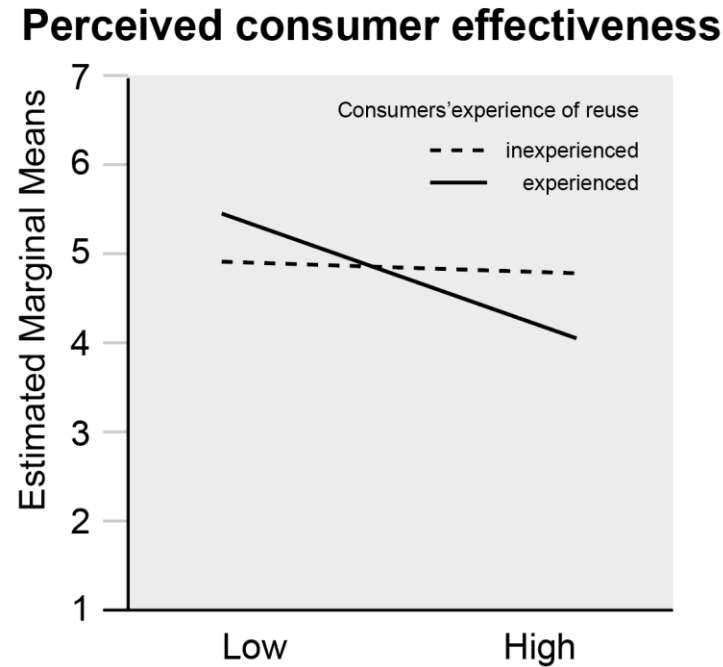
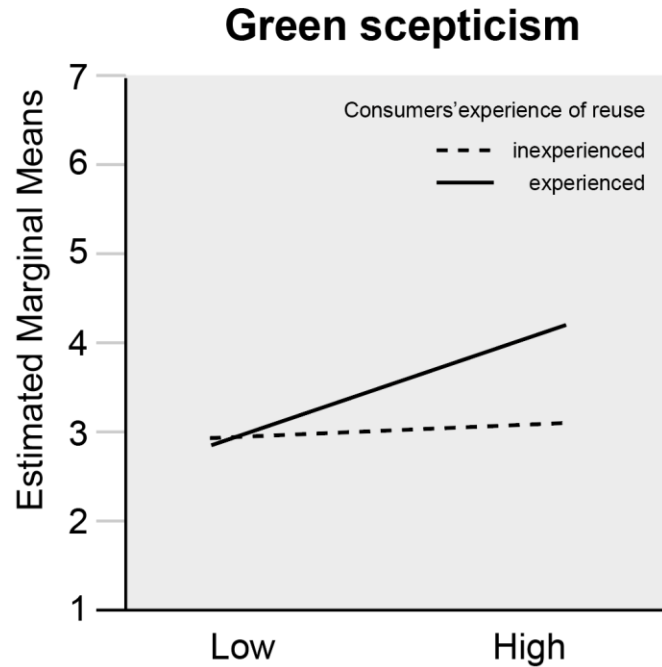
Best before
30.05.2024

per portion (75g)
269 kcal
1141 kJ
100 g:
355 kcal
1507 kJ

0 705632 086943 >

How do you feel when you need to reuse this rice packaging for **5 times** / **45 times**?

Reusable packaging: Break-even points (e-BEPs)



- Prior experience of reuse influences consumers' perceptions of e-BEPs.
- Experienced consumers exhibited increased green scepticism and reduced perceived consumer effectiveness in response to high (vs. low) e-BEPs.



Research on concentrates for liquids

Rather scarce at the moment

What would you like to see in research on this topic?

Thank you!

PACKAGED PRODUCE HELPS ME SHOP IN A JIFFY

"I never have to wait till a clerk is free! Fruits and vegetables are weighed and priced packaged in Cellophane... I just pick what I want and go on my way! They're cleaner, too...ready to pop into the refrigerator, wrapper and all. And many are trimmed to save work and waste."

DU PONT Cellophane

BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY
Look at "Cavalcade of America" on Television

Shopping's easier: fruits and vegetables are clean and fresh in DuPont Cellophane

A DIXIE CUP Dispenser in your kitchen saves all this work...

- * No more between-meal dishwashing!
- * No more glasses to be dried and put-away!
- * No more broken glasses!
- * No more piled-up sinks after late-hour snacks, or after-school milk!
- * Dixie Dispenser mounts on any wall or cabinet in a jiffy!

Look for the big economy size... the thrifty way to buy Dixie Cups for everyday home use

Now at a price you can afford for everyday home use!

Another Dixie Cup advertisement appearing in LIFE, May 3, 1954

Tote those empties? Or toss 'em away?

Why make hard work out of enjoying soft drinks? Every delicious flavor now comes in throwaway steel cans. No deposits, no returns. And soft drinks in steel cans taste so darn good!

BETHLEHEM STEEL

BETHLEHEM STEEL

for Convenience... Purity... Safety