

# Flexible Packaging – Approaches to Improve Recycling and the Role for Compostables

By Eric Klingenberg, Ph.D.  
Materials Science Program Lead

*TAPPI*

April 15, 2024



**MARS**

**MARS**  
Global Food  
Safety Center



**MARS**  
Advanced  
Research Institute

The world  
we want  
tomorrow  
starts with  
how we do  
business  
today  
**MARS**



**Five Principles**

**150,000+ Associates**  
are united and guided by Five Principles of Mars,  
which span geographies, languages, cultures and  
generations



**1911**

Frank C. Mars made the  
first Mars candies in his  
Tacoma, Wash., kitchen

**70+**

Markets  
worldwide



**HQ**

Global HQ in  
McLean, VA

**glassdoor**  
**BEST PLACES  
TO WORK**



Private,  
family-owned  
company



**\$47B+**  
NET SALES



**170+**

Mars brands are  
enjoyed in 170+  
markets worldwide

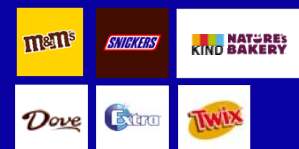


**400+**  
SITES

**3,000**  
VETERINARY HOSPITALS

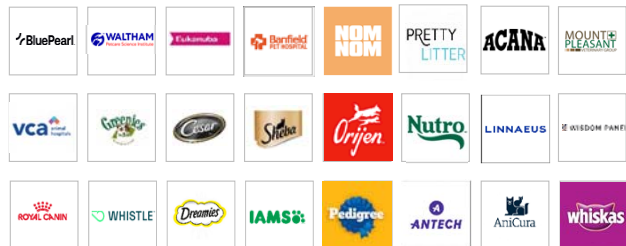


**Billio n Do lla r  
Bra nds**



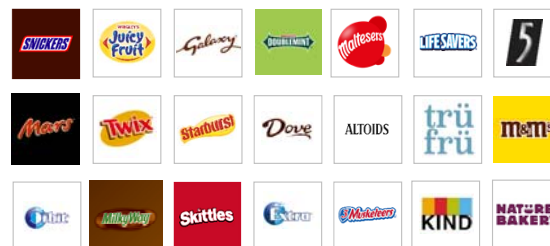
**MARS**  
Petcare

*A Better  
World For Pets*



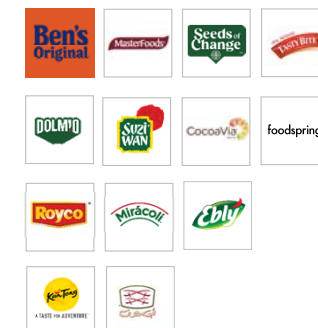
**MARS**  
Snacking

*Happy moments  
of everyday  
happiness*



**MARS**  
Food & Nutrition

*Nature food today  
A Better World For Pets*



**MARS**

Note: Net sales reflect fiscal year ended December 31, 2022 in accordance with U.S. GAAP

## Flexible packaging has many sustainability benefits

### Material Efficiency



### Energy Efficiency



### Food Safety



**MARS**

**MARS**  
Global Food  
Safety Center



**MARS**  
Advanced  
Research Institute



Approximately 36% of all plastic produced is used to create packaging, 85% of which ends up in landfills.

- World Economic Forum -

# Mars progress toward sustainable packaging



Eliminate unnecessary packaging



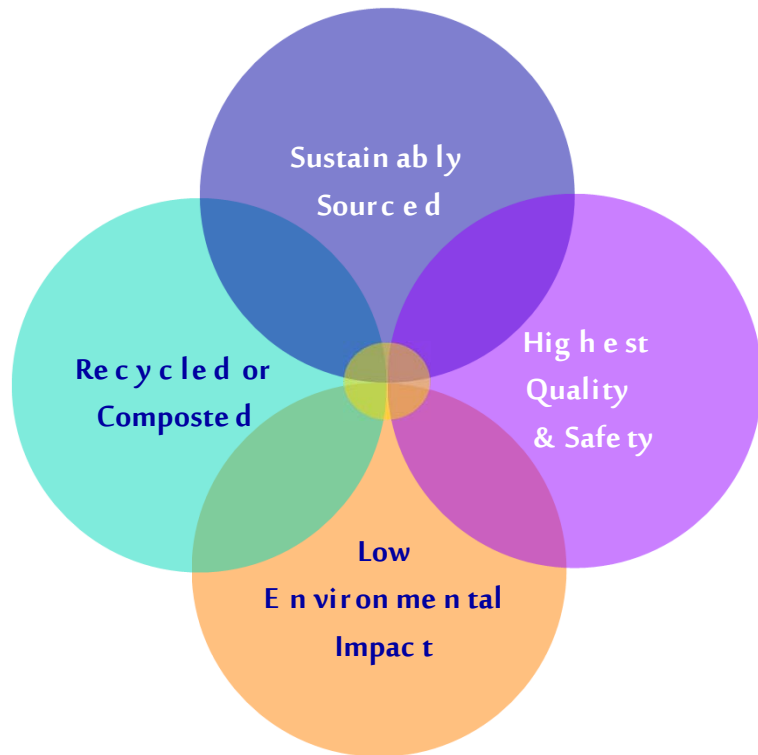
Redesign for circularity



Close the loop

## Our longer-term goals

### The “Sweet Spot”



Through the collective effort of hundreds of Mars Associates and hundreds of millions of dollars in investment, we're **re designing 12,000 packaging components** and continuing to push the boundaries of **packaging innovation**..

## Why compostable packaging?



Innovation in increasing availability of packaging that performs across many food applications



Resonates with sustainable-minded consumers



Infrastructure is increasingly available globally



Certification ensures recycling performance and adherence to environmental metrics

Compostable packaging can be a solution to hard-to-recycle packaging types.

Sustainable Packaging Coalition, January 2021



## Composting and compostable products resonate with consumers



Paper-based packaging is perceived as sustainable and biodegradable



45% of Gen Z and 41% of millennials compost



Global study shows consumers rank compostable packaging as most sustainable option



## Innovation and scale

# MARS

**danimer**  
scientific  
*A Biotechnology Company*

- >6% year-on-year growth for compostable packaging
- Innovation on compostable materials is increasing
- Global availability of all compostable plastic resin exceeded 1.1 MT in 2022

## MARS

**MARS**  
Global Food  
Safety Center



**MARS**  
Advanced  
Research Institute



Copyright © 2024 Mars, Incorporated — Confidential

## Certification and compostability



### Certification Provides Security

Third-party certification ensures compostable plastics perform and meet high environmental standards

### Design for Composting Works

Composting study in 2023 shows compostable packaging results in ~2% average residuals, while paper results in ~17% residuals



## Composting infrastructure is growing (U.S. example)



~**3,000** full-scale compost facilities accept yard waste<sup>1</sup>

~**200** full-scale compost facilities accept food waste<sup>1</sup>



**9 states** and **7 major cities** with organics bans and/or food scrap collection requirements

**49%+** in curbside organics collection between 2021 and 2023<sup>1</sup>



**13%+** full-scale compost facilities that accept food-contact compostable packaging<sup>1</sup>

**8%+** in those that accept food waste since 2018<sup>1</sup>

1. Data from BioCycle Nationwide Survey: Full-Scale Food Waste Composting Infrastructure in the U.S.

Note: Full-scale facility is defined as a municipal or commercial operator open 12 months per year; able to receive truckloads of food waste, and typically processes >2,000 tons/year.



# Challenge of contamination and responsible introduction

Post Residential is Hard



Clean Compost



Contamination

Closed Venue is Enabling



Towards Zero Waste

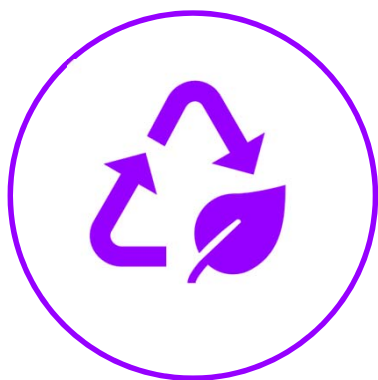
There just isn't enough certified compostable resin yet available to reduce contamination

# Looking ahead: Challenges and opportunities

|                                                                                                                                             |                                                                                                                |                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Balancing circularity and sustainability</p>          |  <p>Cost...</p>             |  <p>Waste infrastructure differences<br/>(globally, nationally, locally)</p> |
|  <p>Test and learn</p>                                    |  <p>Material innovation</p> |  <p>Material availability</p>                                                |
|  <p>Package design for performance in use and at EOL</p> |  <p>Certification</p>      |                                                                                                                                                                 |



## Summary



Flexibles are  
sustainable



Innovate



Collaborate



Be responsible



**The world we  
want tomorrow  
starts with how we  
do business today**

**MARS**