# Triad partnership to reduce and optimize dairy package waste

GROUP 2

SDG case competition

## TRIAD PARTNERSHIP TO REDUCE AND OPTIMIZE DAIRY PACKAGE WASTE

**Idea**: to assess and use the properties of FreshQ and/or other bacteria to redesign packaging of dairy products so as to reduce waste or make it recyclable

**Background**: decisions regarding packaging of dairy products, including yogurts, are influenced by several factors: 1) oxygen permeability, 2) light protection, 3) water vapor transmission rate, 4) consumer preferences, 5) costs, and 6) regulatory, including environmental standards [A1.1]. While the focus usually lies on the packaging material, the types of bacteria that go into a yogurt can also have an impact on how resistant the product is to oxygen or light. This is where Chr Hansen's expertise comes into play. *We propose a partnership with dairy manufacturers and packaging companies to explore and assess the use of different bacteria to redesign yogurt packaging in a more sustainable way.*

**Problem**: currently, dairy packaging in most European countries is not sustainable: mostly plastic or non-recyclable Tetra Pak packages are used [A1.2]. Moreover, plastic recovery rates across the EU remain low [A.2]. Given the current trend for on-the-go consumption, we expect further proliferation of smaller, harder to recycle packages [A1.3].

**Potential directions**: while more technological expertise is necessary to assess the feasibility of different options, we have outlined some directions that we believe are worth looking into:

- We identified several ways to make packaging more sustainable: 1) using less plastic by either offering bigger packages (thus reducing the plastic-to-product ratio) or using lighter and thinner packages; 2) using recyclable (clear returnable) plastic, or 3) switching to glass packaging; both 2) and 3) can be recycled using the bottle refund systems implemented in some countries; 4) using more cardboard-based solutions (e.g. Tetra Pak).
- Use of FreshQ: 1) if yogurts with FreshQ have longer shelf life, it may be possible (depending on consumer preferences) to offer bigger packages so as to reduce the plastic-to-yogurt ratio without producing food waste; 2) it is worth exploring whether FreshQ-related longer shelf life can compensate for and offset the oxygen, light and water vapor protection losses that may occur when switching to other materials.
- Oxygen scavenger bacteria: developing and marketing bacteria that would offset the increased oxygen penetration resulting from different materials.

**Location**: EU; initial launch in Scandinavian countries and gradual transition to other countries, particularly where plastic post-consumer landfill rates are high [A2].

**Risks/considerations**:

- Costs of new materials compared to the conventional ones
- Switching costs, including manufacturing and transportation costs
- National contexts in terms of regulations and facilities (e.g. for waste management)
- Consumer preferences for packaging sizes, shapes, etc.
- Plastic waste/food waste trade-off

### SHOWCASE

We propose a triad partnership between Chr Hansen, Arla and Tetra Pak in Scandinavian countries to identify feasible and sustainable packaging solutions in the context of current needs and challenges. Both companies have expressed interest in devising more sustainable solutions (particularly in regard to SDG 12), which is also in line with current consumer preferences [A1.4,1.5, 1.6]. For instance, Tetra Pak recently designed its first fully renewable bio-based package Tetra Rex; however, it appears that it is currently used primarily for milk products. Properties of other products (e.g. yogurt) may not make it immediately suitable for other dairies - a gap that can be fulfilled using bacteria designed to extend products' shelf life, such as FreshQ.

**Impact**:

*Dairy manufacturers*: cost savings up to 20% - for Arla, this is EUR 370-860 million [A1.7; A3]; sustainable production; improved image

*Packaging companies*: product innovation; increased sales; decreased material costs – up to 42% [A.4]

*Chr Hansen*: reduced food waste (SDG 12.3); reduced or more sustainable waste (12.2, 12.5 and 12.6); increased sales; product innovation

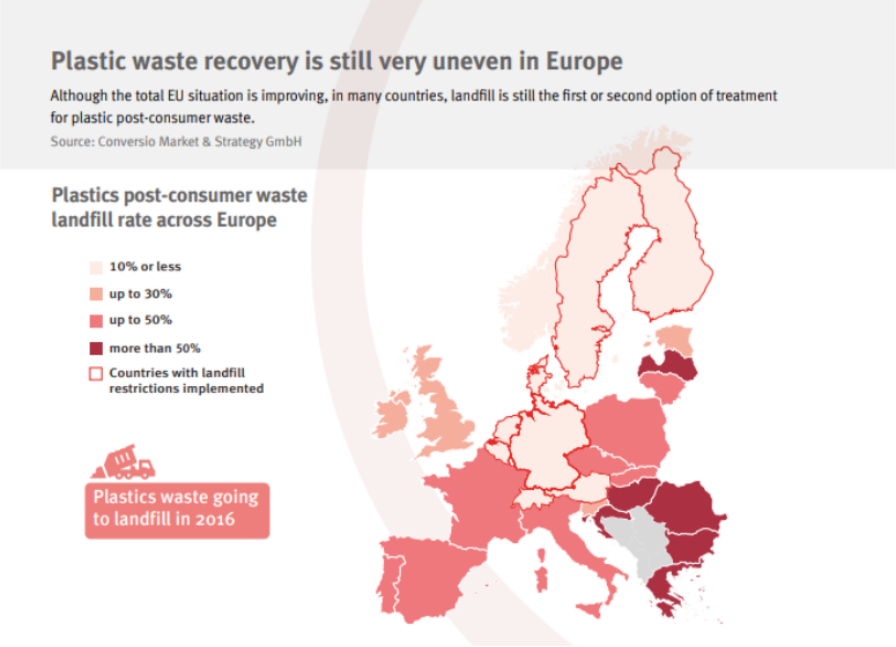
*Retailers and end consumers*: contribution to reducing waste (SDG 12.5)

## Appendices

### Appendix I - Links and references


1. MacBean R.D. (2010) Packaging and the shelf life of yogurt. In: Food packaging and shelf life: a practical guide (ed. by Gordon L. Robertson). Taylor and Francis.
2. Euromonitor International http://www.euromonitor.com/dairy-packaging
3. Skoda, E. https://packagingeurope.com/on-the-go-food-convenience-trend/
4. Arla Foods https://www.arla.com/company/responsibility/environmental-strategy/zero-waste/
5. Tetra Pak https://www.tetrapak.com/packaging/tetra-rex
6. Euromonitor International http://www.euromonitor.com/dairy-packaging-in-sweden/report
7. Deutsche Welle http://www.dw.com/en/what-to-do-about-germanys-mounting-packaging-waste/a-36657662


### Appendix II




*Source*:
https://www.plasticseurope.org/application/files/5715/1717/4180/Plastics_the_facts_2017_FINAL_for_website_one_page.pdf

### Appendix III - Cost saving estimations (Arla, 2017)

| *Other production materials (million Euro)* | *1231* |
|---|---|
| Proportion of packaging (assumption) | Packaging cost (million Euro) |
| 30% | 369.3 |
| 50% | 615.5 |
| 70% | 861.7 |

## Appendix IV – Material saving estimations

| Volume/ml | Bottom Diameter (cm) | Bottom Area ($cm^2$) | Height (cm) | Total Package Area($cm^2$) | Specific Package Area ($cm^2$/ml) |
|---|---|---|---|---|---|
| 1000.0 | 10.0 | 78.5 | 12.7 | 478.5 | 0.5 |
| 1500.0 | 10.0 | 78.5 | 19.1 | 678.5 | 0.7 |
| | | | | Packaging Material Saving | 42% |