

New technologies  
incorporated into  
the Huhtamaki  
Aporo tray

# Introduction to Huhtamaki

- With operations in 34 countries around the world we're well placed to support our customers growth
- We adapt and deliver packaging that meets local demands
- We're a pioneer in entering emerging markets, and have a strong presence there



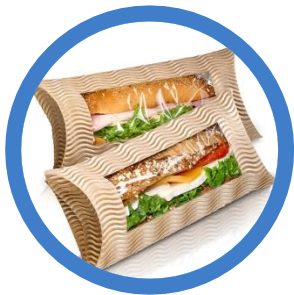
24  
sales  
offices

17,000  
employees

74  
manufacturing  
sites

# Our three business areas are organized into four reporting segments

## Foodservice packaging



### Foodservice Europe-Asia-Oceania and North America

- 39 plants on 5 continents
- 7,700 employees
- €1,6bn net sales

## Flexible packaging



### Flexible Packaging

- 22 plants on 3 continents
- 6,400 employees
- €870mn net sales

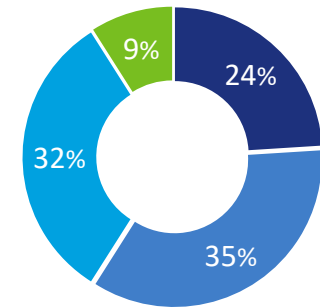
## Molded fiber packaging



### Molded Fiber

- 11 plants on 4 continents
- 1,700 employees
- €260mn net sales

## Share of net sales per segment in 2015



- Foodservice Europe-Asia-Oceania
- North America
- Flexible Packaging
- Molded Fiber





World population 7.7 billion people (2018)

We touch people's lives multiple times every day

18

billion drinks served from our cups every year

5

billion pet meals packed in our laminate every year

6

billion meals eaten from our plates every year

52

billion eggs packed in our moulded fibre packaging every year





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## Sustainable

The Moulded Fibre Huhtamaki uses for these trays is made from recycled paper and is 100% biodegradable. Add this to the reduced energy expenditure in cooling and you have a thoroughly sustainable and environmentally-friendly solution. Produced in Europe, the Molded Fiber packaging products have borne the internationally recognized FSC™ logo since early 2013. New Zealand Products should have FSC™ Certification by the end of 2016.



Huhtamaki South Africa has upgraded their current range of fruit trays and designed a new MK4 apple tray (Aporo) for maximum strength and efficiency, so first class fruits arrive at their destination in first class condition. A first class fruit travel experience.

Nutritious and delicious, fruits are a popular treat in many countries. But they don't grow well everywhere and often need to travel to reach their consumers. With millions of fruits being shipped and sailing their way around the globe every day, the way they are packaged has become increasingly important to reduce the chances of bruising, and ensure they arrive at their destination as fresh, crisp and juicy as when they left.

The new trays are flatter and stronger than ever before, with improved airflow, better handling qualities, improved ventilation for fumigation and a reduction in overall pack weight. Using these trays also means less time, and therefore less energy required for cooling – only one of its many sustainable qualities. Huhtamaki's goal is to have the best fruit trays on the market.

# FRUIT



## Customers

We supply in all your needs, helping your products reach more destinations.



## Improved

Stronger, easier to handle and better airflow, improve ventilation.



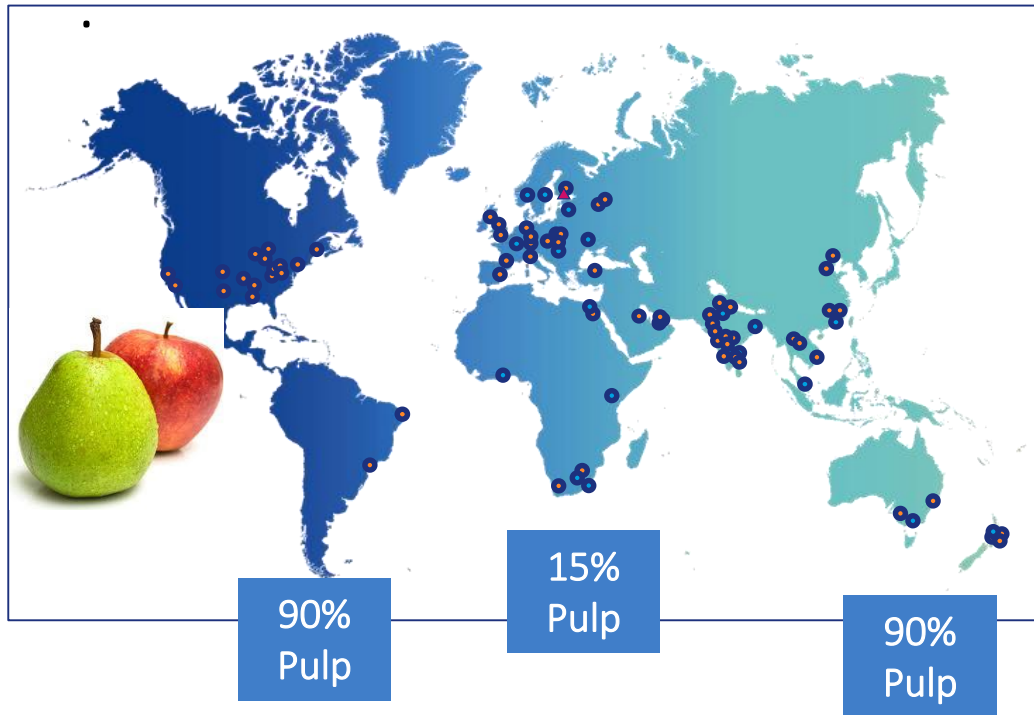
## Consumer

**Huhtamaki**  
fresh, crisp and juicy

Packaging that helps great products reach more people, more easily

**Huhtamaki**

# Southern Hemisphere Apple & Pear Business in pulp trays



85% Pulp



# Challenges for the Mk4 trays

- Africa main issue due to current Mk4 strength, In many African countries this is use to transport the fruit
- Sometime the cold chain was broken (condensation)
- Handling of the trays in Africa when they are sold



- How vendors in the African Markets displayed products





Aporo = Apple

Huhtamaki New Zealand has designed a new apple tray for maximum care and efficiency, so first class apples arrive at their destination in first class condition.

## A first class apple travel experience



Nutritious and delicious, apples are a popular treat in many countries. But they don't grow well everywhere and often need to travel to reach their consumers. With millions of apples flying and sailing their way around the globe every day, the way they are packaged has become increasingly important to reduce the chances of bruising, and ensure they arrive at their destination as fresh, crisp and juicy as when they left.

The Aporo tray is flatter and stronger than ever before, with improved airflow, better handling qualities, improved ventilation for fumigation and a reduction in overall pack height. Using these trays also means less time, and therefore energy, required for cooling – only one of its many sustainable qualities. Aporo's goal is to be the best apple tray on the market.

# IMPROVEMENTS

1. Changed the shape of the tray to easily handle the product in/out of a carton
2. Added a wet strength resin and longer fibres to our was added to the Mk4 trays to improve the quality and to improve the performance in humid conditions (**Wet strength is of a organic composition and it is 100% biodegradable**)
3. The product cure with age and the bonding between the fibres gets stronger and the product can be used after extensive storage.



## Trials and tests (ExperiCo)

- In 2017 HSA introduced the new Aporo tray and we asked (Experico) a 3<sup>rd</sup> party to do intensive tests and trials on our new improved Mk4 tray
- **Cooling** - The Aporo tray is 7% better than other trays within the market. (energy saving)
- **Lifting** In all tests the Aporo tray performed better than all the other trays. (In cases with extreme free water and relative humidity)
- **Water absorption and protection** from decay: Again new pulp tray performed better than other trays within the market.
- **Bruising** – No significant difference between the tested trays

# Aporo Tray – Apples (Improvements)

## Packing



- The new shape tray allows easy handling.
- During packing operators can easily lift and place the tray.
- Very effective with **tray filling** machine.
- Also fits into the new 22 pallet Mk4 carton

## Cooling



- The new shape tray allows for better airflow during cooling.
- The tray was found to be 7% better than all current trays on the market.

## Strength



- During lab and commercial testing (packing, cooling, transporting) the Aporo tray was found to be the strongest tray and most suitable for African market



# Thank you

Andre du Toit  
083 269 9049

**Huhtamaki**

# ExperiCo Results



PROJECT NUMBER :	17-01-PA-019	SEASON :	2017
CLIENT :	Huhtamaki	CLIENT CONTACT :	Mr. Robert Marshall
RESEARCHER :	Heinie Joubert	PROGRESS :	Completed
CO-WORKERS :	ExperiCo Laboratory	PROJECT LEADER :	Dr Johan Fourie

Evaluate the impact of the new composition Huhtamaki pulp tray on fruit quality.

## OBJECTIVE:

The objective of the trial was to evaluate the impact of two new composition Huhtamaki pulp apple trays on fruit quality, compared to apples packed in a reference polystyrene apple tray.

For each of the three fruit tray types, 56 x MK4 cartons Golden Delicious apples, count 135, were packed by a commercial packing facility. ExperiCo simulated the commercial handling and export of the apples to the African market in order to observe the possible impact of the new composition pulp trays on fruit quality. Laboratory tests were also conducted on empty trays to establish water absorption and strength characteristics.

## MATERIALS AND METHODS:

### Laboratory strength tests

Trays were tested after it was exposed to the following extreme conditions:

- Wet test: Empty trays were submerged in water for 15 minutes, before assessment.
- Relative Humidity (RH) test: Empty trays were placed in a sealed container, with a high level of relative humidity induced with for three days, before assessment.

The strength of the trays was tested by packing 27 apples on a wet tray and lifting the tray. If no damage occurred after lifting the 1<sup>st</sup> time, more apples were added in multiples of five, followed by subsequent lifting of the trays.

### Shipping simulation

Commercial handling and shipment of apples to the African market was simulated by storing the fruit at -0.5 °C for 3 weeks followed by 1 week shelf life at 20 °C. At the end of the shelf life period the following two tests were conducted:

- Quality evaluation: Apples on each tray were evaluated before lifting the tray from the carton. Evaluation parameters included bruising, decay, superficial scald, lenticel spots, shrivel, rub marks, bitter pit, free water in cups and damage to trays (assessment without lifting the trays).
- Lifting test: Apple trays were lifted from commercially packed cartons. Evaluation parameters included the ease of lifting, damage to trays, damage to fruit during lifting and the weight of empty trays.

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Separate random samples were taken from each layer of the pallets for the quality evaluation and the lifting tests, respectively.

## RESULTS:

The results of the laboratory tests and shipping simulation were discussed with the client during a feedback session on 1 June 2017. The client received digital copies of data and graphs discussed during the feedback session, as well as photos and videos recorded during the evaluations.

## FINDINGS:

- The Huhtamaki F-tray proved to be stronger than the other two trays (C and M-trays) in the laboratory wet strength test. The extent of the damage was not quantified.
- The Huhtamaki F-tray proved to be stronger than the other two trays in the laboratory RH strength test. The extent of the damage was not quantified.
- Free water was observed in 17.2% of the cups of polystyrene trays, but in none of the cups of the pulp trays.
- Apples in the polystyrene trays (M-tray) had lower incidence of bruising than the pulp trays (F & C-trays).
- The average number of apples bruised per tray was the lowest for the polystyrene trays with  $\pm 2$  apples per tray, compared to 3 for the Huhtamaki F-trays and 4 for the Huhtamaki C-trays.
- Both pulp trays (F & C-trays) exhibited below 1% fruit damaged during the simulation lifting tests. Fruit damage during the simulation lifting test was the highest for the polystyrene M-trays (15.3%).
- Both pulp trays recorded much lower incidence and severity of tray damage during the simulation quality evaluation, as well as the simulation lifting tests, compared to high incidence of tray damage recorded for the polystyrene trays.
- Both pulp trays recorded better ratings than the polystyrene tray in terms of the ease of lifting the trays from the packed cartons.

## RECOMMENDATIONS:

The strength of the Huhtamaki F-tray proved to be better than the other two trays in all the tests conducted, including exposure to extreme free water and relative humidity. Although the Huhtamaki F-tray exhibited more bruising (1 fruit per tray) than the polystyrene M-trays, the superior performance of the Huhtamaki F-tray should provide a positive experience to the end-user in terms of less tray damage when handled during the logistical chain.

## BENEFIT TO CLIENT:

The client managed to improve the quality of its fruit trays through a series of laboratory and simulation trials, limiting tray damage during conditions of extreme wetting as delivered by free water and high relative humidity.

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# ExperiCo Cooling results



PROJECT NUMBER :	A 11-17	SEASON :	2017
CLIENT :	Huhtamaki	CLIENT CONTACT :	Mr. Robert Marshall
RESEARCHER :	Marius Leuvenink	PROGRESS :	Completed
CO-WORKERS :	Heinie Joubert	PROJECT LEADER :	Dr J. Fourie

Evaluate the impact of the new Huhtamaki apple pulp tray on cooling rate.

#### OBJECTIVE:

To compare the cooling rate of apples packed in a new pulp tray supplied Huhtamaki to the cooling rate of fruit packed in other tray types.

#### SUMMARY:

The cooling rate of apples packed in the new design Huhtamaki pulp tray were compared to the cooling rate of apples packed in: (1) the previous design Huhtamaki pulp tray and (2) polystyrene apple trays used in industry. The results indicated that the 90% cooling rate of apples packed with the new design Huhtamaki pulp tray was  $\pm$  7% faster than the polystyrene tray, while similar to the previous design pulp tray.

#### MATERIALS AND METHODS:

The cooling rate of apples packed in different trays, exposed to similar conditions and forced-air cooling in a controlled environment was recorded using temperature loggers. The process was repeated three times for each comparison. The positions of the trial pallets were rotated for each repetition to limit the influence of other variables in the larger cold store.

#### RESULTS:

The results of the cooling trial is summarised in Table 1 below.

**TABLE 1:** 90 % Forced-air cooling time (hours) for different trays and replicates

Replicate	Trial 1		Trial 2	
	New pulp	Old pulp	New pulp	Polystyrene
1	63.51	67.34	61.31	61.90
2	62.61	57.01	68.97	78.82
3	71.73	70.44	69.55	74.20
Average (hours)	65.95	64.93	66.61	71.64

#### RECOMMENDATIONS:

The findings and interpretation of the findings were discussed with the client during a feedback presentation on 9 March 2017.

#### BENEFIT TO CLIENT:

The faster cooling rate of the new design Huhtamaki pulp tray compared to the polystyrene tray may lead to energy savings and better utilisation of forced-air cooling capacity for users of the new design tray.

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