



**MULTIVAC**

**SUDPACK**

Future Pet Food Conference 2024

# Innovations in Pet Food Packaging

## Focus on Sustainability and Cost Efficiency



**MULTIVAC** **SUDPACK**



## About Us

**SÜDPACK**



**Matthias Schräggle**

VP R&D Group  
Südpack

**MULTIVAC**



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Corporate Product Manager  
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## Agenda



**Vision**



**Development**



**Comparison**



**Future Goals**



About

# Solutions by MULTIVAC


## Solutions by MULTIVAC

### Wet & Semi Moist Pet Food

### Snacks & Treats




Raw



Gently Cooked



Sterilized



Snacks & Treats

## Sterilized Wet Pet Food: Market Entry Strategy MULTIVAC

Topic of the presentation

Option 1:

### New Processing & Packaging Method

Continuous direct steam injection heating,  
followed by hot filling and packaging

Partners



Option 2:

### New Packaging Method

Use of a thermoformed flexible film packaging,  
sterilized in an autoclave

Partners





Vision | Our new way of

# Packaging Wet Pet Food



**Vision**



## Our Vision: Rethinking Packaging for Wet Pet Food

### Our target scope ...



more  
sustainable



simplified  
handling



greater package  
individuality



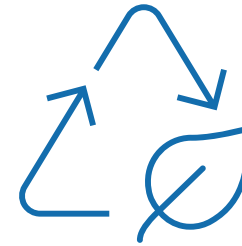
increased  
cost efficiency

**... with concepts that enable sterilization  
and meet retail & customer requirements.**

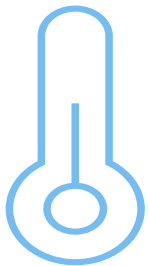
## Our Concept: New Solution for Sterilized Wet Pet Food



**Package Type:  
Thermoformed Package**



**Packaging Material:  
Reduction & Recycling**



**Storage:  
Room Temperature**



**Shelf life:  
> 12 Months**

## Stronger Together: Selecting the Right Partner

### Selection process

**30 film manufacturers**  
in the initial selection

**SUDPACK**

### Key arguments

- Owner-managed, medium-sized company
- Decades of trustful cooperation
- Highly innovative company with focus on sustainability



Innovation

# Film Development 1.0



**Development**

## Film Development 1.0

### Main Targets for the Development of a Retortable and Thermoformable Film:

- **Withstand Retort Process:**
  - Capable of enduring temperatures up to 128°C for 45 minutes.
- **Thermoformable Film:**
  - Ensuring the film can be easily thermoformed.
- **OTR Barrier:**
  - Maintaining an oxygen transmission rate (OTR) barrier below 1 after the retort process.
- **Reduced Whitening Effect:**
  - Minimizing the whitening effect post-retort.

## Film Development 1.0

- **Materials for thermoforming**

Material	Function
PA	High elongation and stress resistance
EVOH	Flexible, Barrier OTR
PE	Thermal Sealability

Under retort
water absorption
retort shock
melting @ 100°C

Material	Function
PA	low water absorption and good elongation; low re-shrinkage
EVOH	Maintains OTR under retort conditions and high humidity
PP	Good formability and temperature resistance > 135°C; high sealing force

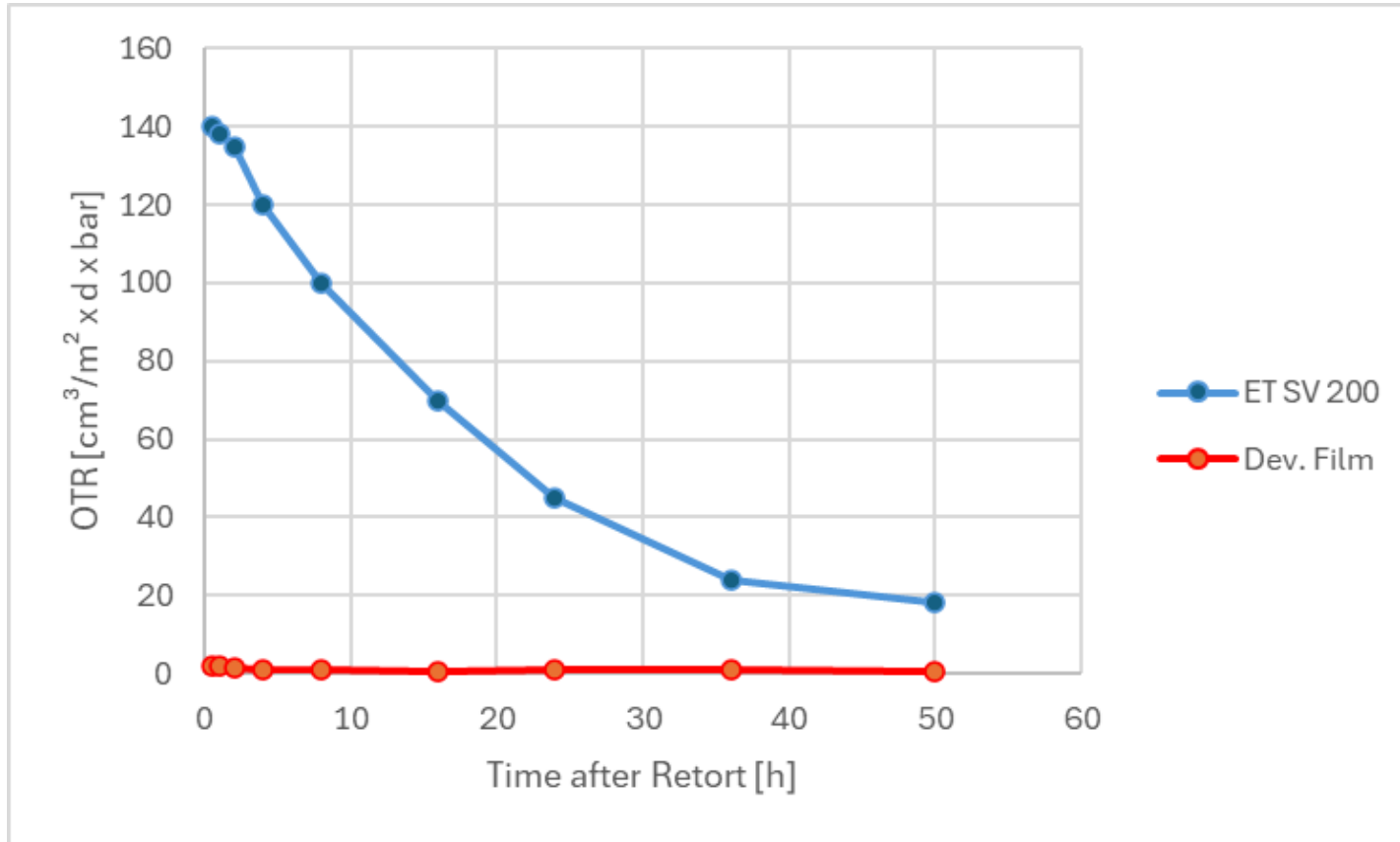
- **Materials for retort**

Material	Function
Alu / AlOx / SiOx	Barrier
PP	Thermal Sealability

Under thermoforming
Break – loos of barrier
limited available resins

During sterilization at e.g. 128° C, EVOH can experience “retort shock.” The barrier properties significantly decrease due to high temperature and humidity.

## Film Development 1.0



Based on the selection and positioning of EVOH and PA in the development film, laboratory tests demonstrated an oxygen transmission rate (OTR) barrier of approximately  $1 \text{ ccm}/\text{m}^2 \times \text{d} \times \text{bar}$

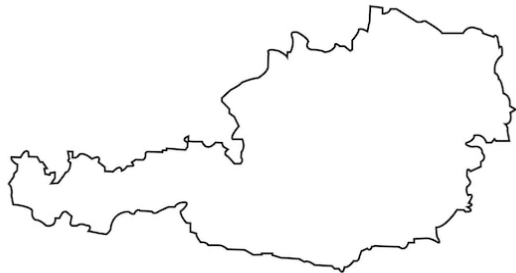
This performance was significantly better compared to a standard film.

## Inclusion of Pet Food Manufacturers

### Customer-centered development

#### Customer Austria

- Medium-sized family business in its 4th generation
- Specializing in meat products
- Pet food for several years



#### Customer Switzerland

- Internationally active group
- Equally specialized in human and pet food
- In the top 20 in Europe for pet food





## Sterilization Test: Customer Austria

### Package:

- thermoformed flex film vacuum package
- 250 µm bottom film | 125 µm upper film

### Autoclaving process :

- Temperature: 121 °C
- Bar: 2,4 bar
- Time: 1:40 h

### Result

- Still perfectly sealed packages
- No evidence of material degradation
- No visible degradation of the pet food



## Sterilization Test: Customer Switzerland

### Package:

- thermoformed flex film vacuum package
- 250 µm bottom film | 125 µm upper film

### Autoclaving process :

- Temperature: 129 °C
- Bar: 3,2 bar
- Time: 1:42 h

### Result

- Some packages have burst open at the sealed seam.  
Reason: too much residual oxygen.
- Packages with little residual oxygen are flawless.





Innovation

# Film Development 2.0



**Development**

## Film Development 2.0

- **Tighter Sealing of the Packaging:**

- Enhanced sealing capabilities have been achieved.

- **Modification of PP Resin Selection:**

- Slight adjustments have been made to the polypropylene resin selection.

- **Recyclable solution**

- Our PA-free version currently withstands the pasteurization process. Further development is underway to achieve compatibility with the retort process



## Sterilization Test: Customer Austria

### Package:

- thermoformed flex film vacuum package
- sterilization: 250 µm bottom film | 125 µm upper film
- pasteurisation: 150 µm bottom film | 75 µm upper film

### Autoclaving process :

Temperature: 121 °C  
Pressure: 2,4 bar  
Time: 1:40 h

### Pasteurization process:

Temperature: 85 °C  
Pressure: 1,0 bar  
Time: 1:28 h

### Result

- Still perfectly sealed packages
- No evidence of material degradation



Sterilisation



Pasteurisation



## Sterilization Test: Customer Switzerland

### Package:

- thermoformed flex film vacuum package
- 250 µm bottom film | 125 µm upper film

### Autoclaving process :

- Temperature: 129 °C
- Bar: 3,2 bar
- Time: 1:42 h

### Result

- Slight discoloration of the film, otherwise no change
- Very low residual oxygen content





Innovation Creation

# Comparison with existing Packaging Concepts



**Development**

## Sustainability



### Basis for Comparison

- Recommended daily feed quantity for a 10 kg dog\*  
→ 400g/day (=functional Unit)

### Compared packaging concepts



Steel Can 400g



Alu-Tray 100g



Alu-Pouch 85g



PP-Pouch 85g



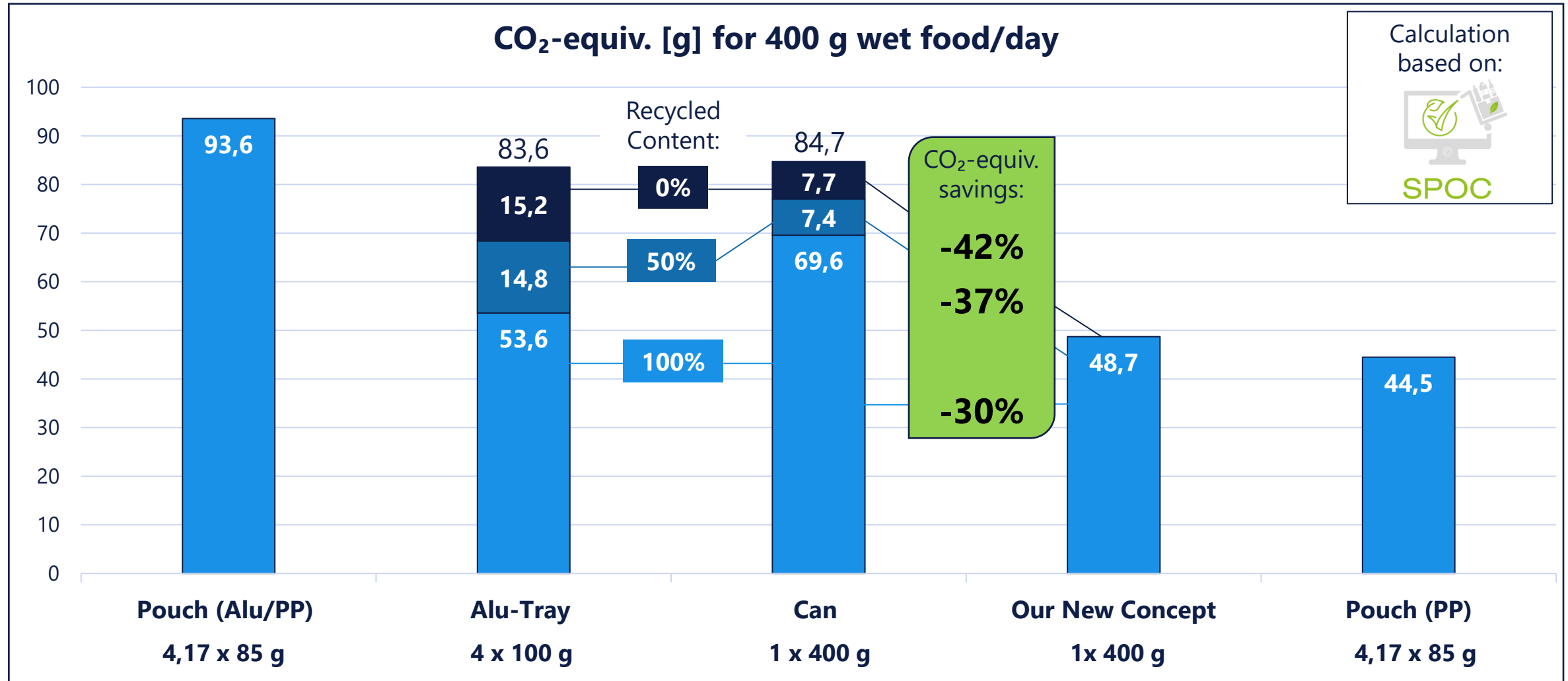
Our Film 400g

### Assumptions

- Components were manufactured in Germany
- Recycling content: 100% for can & tray | 0% for pouches & our new film
- Cans and our new packs are both packed in the same carton boxes
- No Labels included



# Sustainability



## Simplified Handling



<b>Semi trailer truck 40t</b>	Sizes	<b>13,6m x 2,45m x 3m</b>	
	Paletts	<b>68 Pallets</b>	
	Payload	<b>31 Tons</b>	

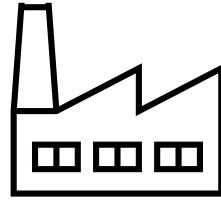
<b>Output</b>	Minute	<b>240 Packs/min</b>	
	Day	<b>161.280 Packs/day</b>	
	Year	<b>40.320.000 Packs/year*</b>	

<b>Compared Packages</b>	<b>Can incl. Lid</b>		<b>Thermoformed Package</b>			
	Weight		<b>65g</b>		Weight	<b>10g</b>
	Sizes		<b>Ø 9,9cm x 6,3cm</b>		Sizes	<b>9,5cm x 9,5cm x 4,4 cm</b>

# Simplified Handling



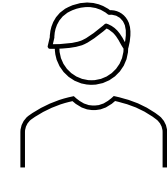
Packaging procurement



Packaging handling



Pet food delivery



Consumer



**98% fewer trucks**



**Our film rolls**  
**1,4 Pallets / Day**  
**6 Trucks / Year**

Database

**Cans** || 161.280 : 1760 Cans/Palette = **92 Pallets/Day** | 40.320.000 Packs/Year : 1760 Packs/Pallett : 68 Pallets/Truck = **337 Tucks/Year**

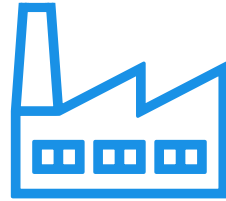
**Our Packs – Bottom Film** || 161280 Packs/day : 4 rows x 0,105 cm/Pack : 0,9 film use : 270 m/roll : 24 rolls/pallet = **0,73 pallets/day** | **4,12 Truck/Year**

**Our Packs – Upper Film** || 161280 Packs/day : 4 rows x 0,105 cm/Pack : 0,9 film use : 500 m/roll : 24 rolls/pallet = 0,39 pallets/day | **2,22 Tucks/Year**

## Simplified Handling



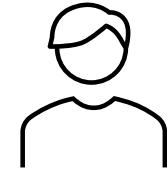
Packaging procurement



Packaging handling

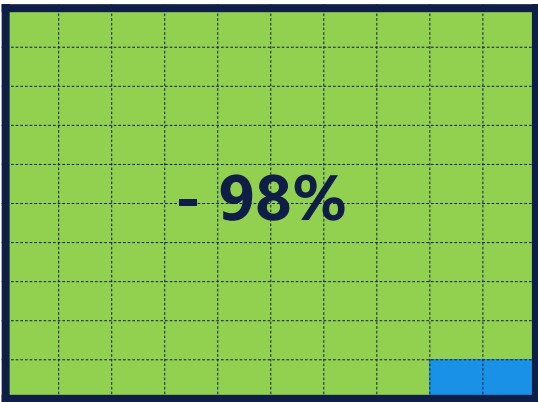



Pet food delivery



Consumer

**Reduced warehouse footprint**



**- 98%**



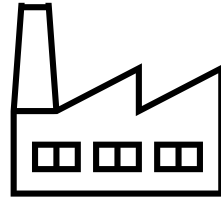
**Smaller machine footprint + more flexibility**



# Simplified Handling



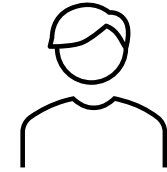
Packaging procurement



Packaging handling



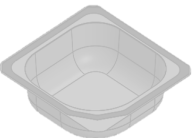
Pet food delivery



Consumer



**63.360  
Cans / Truck**



**72.576 kg  
Packs / Truck**



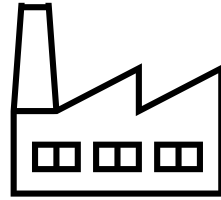
Database

**Cans** || 1760 cans/pallet x 0,465 kg/can + 22 kg/pallet = 840,4 kg/pallet | 31t : 840,4 = 36 Pallets/Truck | 36 Pallets/Truck x 1760 Packs/Pallet = **63.360 Packs/Truck**  
**Our Packs** || 2592 packs/pallet x 0,410 kg/pack + 22 kg/pallet = 1082,72 kg/pallett | 31t: 1082,72 = 28 Pallets/Truck | 28 x 2592 packs/pallet = **72.576 Packs/Truck**

## Simplified Handling



Packaging procurement



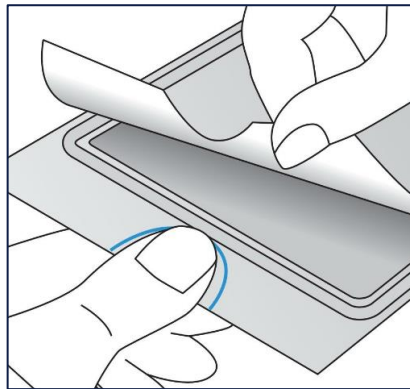
Packaging handling



Pet food delivery



Consumer



Easier to open



No sharp edges



Much less trash

## Greater Packaging Individuality



### Some of the possibilities

- ✓ Packing geometry & size
- ✓ Film type & thickness
- ✓ Opening aids, perforation, embossing
- ✓ Individual printing & labeling

Suitable for the Digital Product Passport





## Cost efficiency



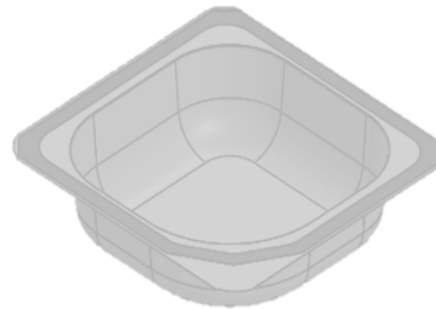
### Can & Lid

- ~ 10 cent/package
- ~ 4.0 mn €/year



### Our flexible film pack

- ~ 5 Cent/package
- ~ 2.0 mn/year



**-50 %  
packaging  
material  
costs**



## Our Vision: Rethinking Packaging for Wet Pet Food

### Our target scope ...



more  
sustainable



simplified  
handling



greater package  
individuality



increased  
cost efficiency

**... with concepts that enable sterilization and meet retail & consumer requirements.**



Futher Goals

**What's next?**



**Future Goals**

## Further Goals | What's next?



Further sterilization tests



Acceptance tests animal & consumer



Shelf-life analysis



Recyclability certification

**Interested? Get in touch with us!**

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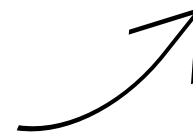
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