



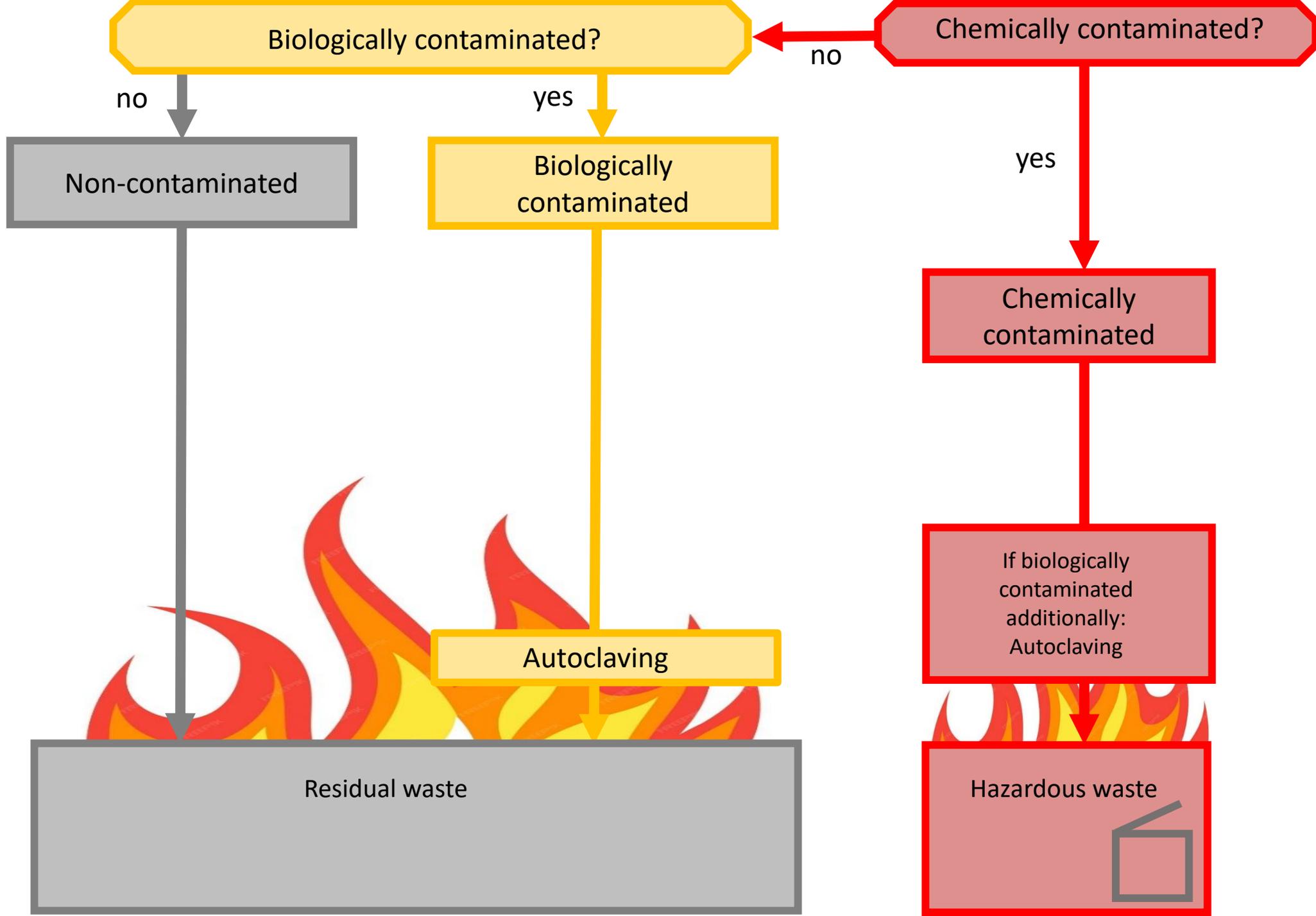
# **Recycling Project in Labs**

**after Reduce Reuse**

**Separate collection of single-use plastic  
items from laboratories**

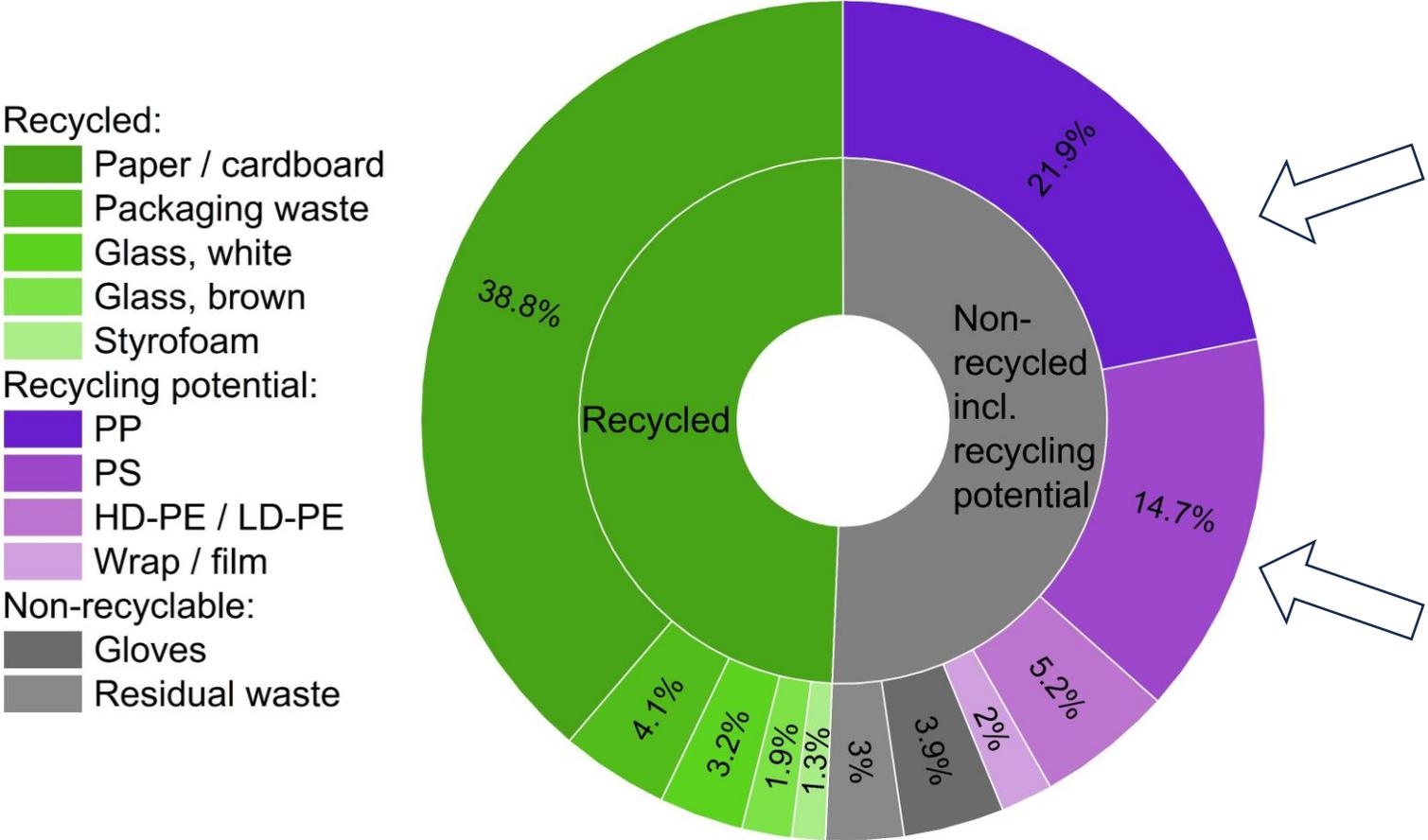


Initial situation: single use



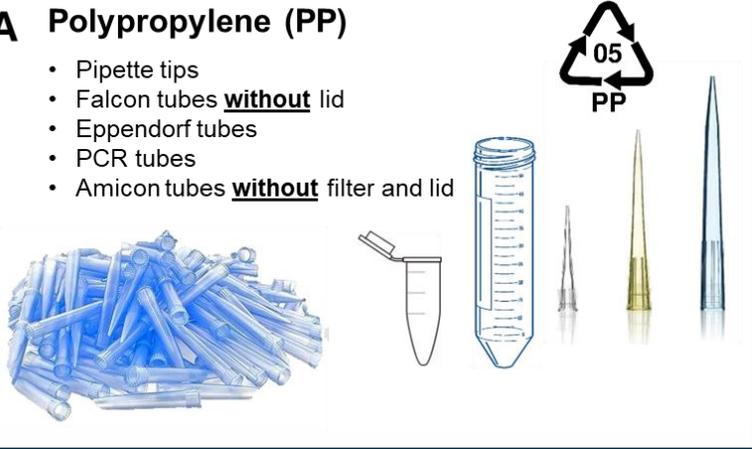


# Waste assessment over one week



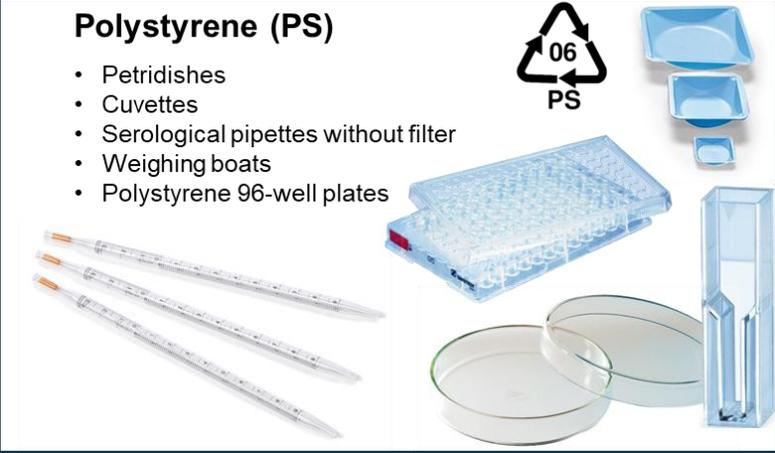
## A Polypropylene (PP)

- Pipette tips
- Falcon tubes **without** lid
- Eppendorf tubes
- PCR tubes
- Amicon tubes **without** filter and lid

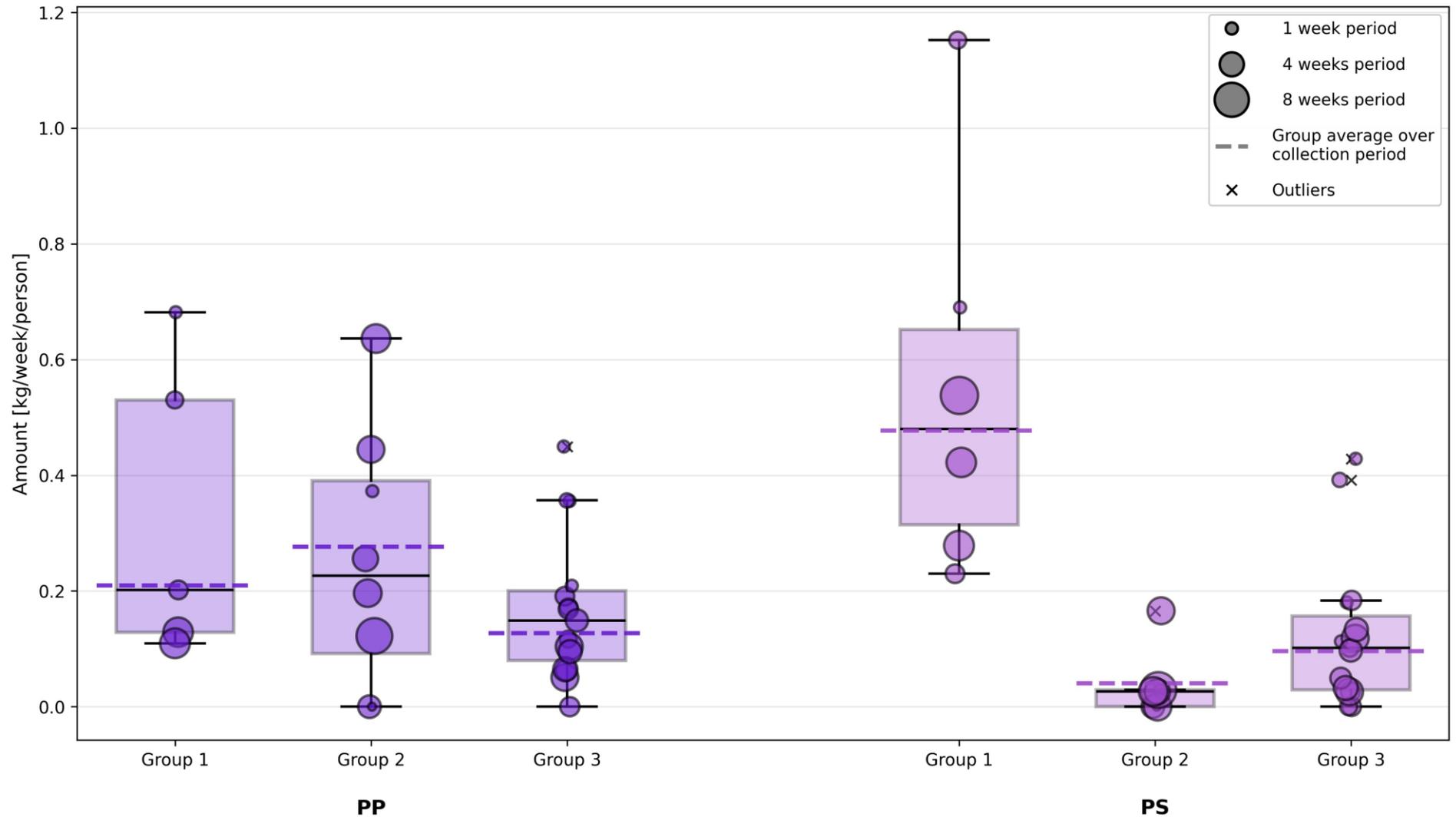


## Polystyrene (PS)

- Petridishes
- Cuvettes
- Serological pipettes without filter
- Weighing boats
- Polystyrene 96-well plates



# PP & PS assessment long-term



# How to achieve recycling



A. Collection of waste plastics

# Obstacles

Space issues

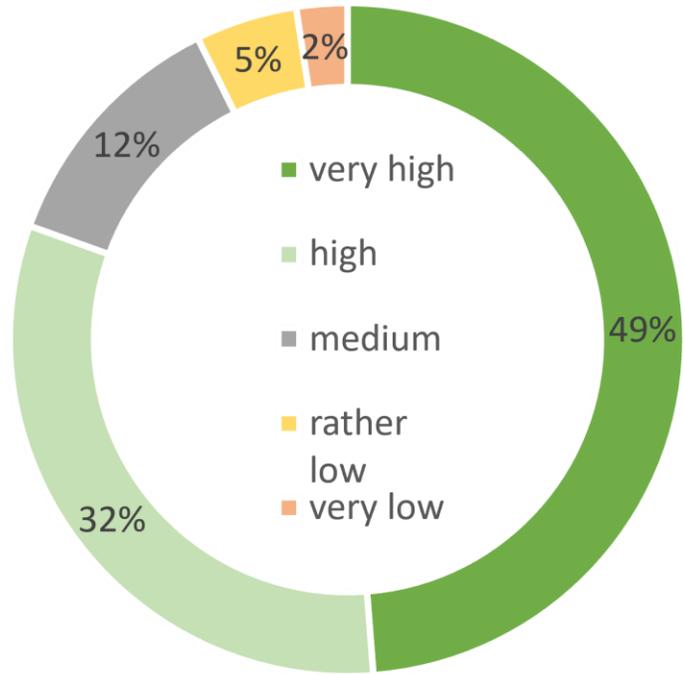


What is chemically contaminated??

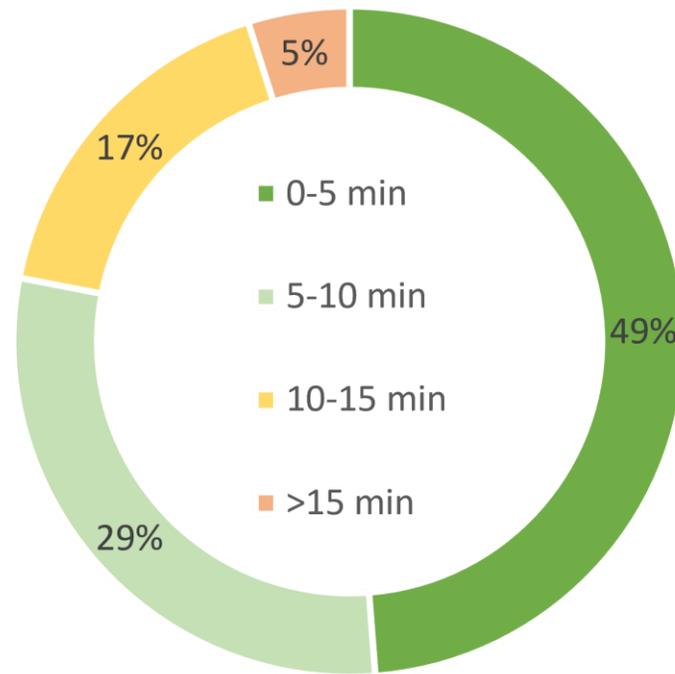
Classification table for dilutions				
Pure substance		Classification of the dilution		
Hazard class + category H statement		Concentration limit <sup>(1)</sup>	Class + Category	H statement
3.1 Acute toxicity (oral)				
Acute Tox. (o) 1	H300	$c \geq 10\%$	Acute Tox. (o) 1	H300 Fatal if swallowed
		$10\% > c \geq 1\%$	Acute Tox. (o) 2	H300 Fatal if swallowed
		$1\% > c \geq 0.17\%$	Acute Tox. (o) 3	H301 Toxic if swallowed
		$0.17\% > c \geq 0.1\%$	Acute Tox. (o) 4	H302 Harmful if swallowed

# Lab members' feedback

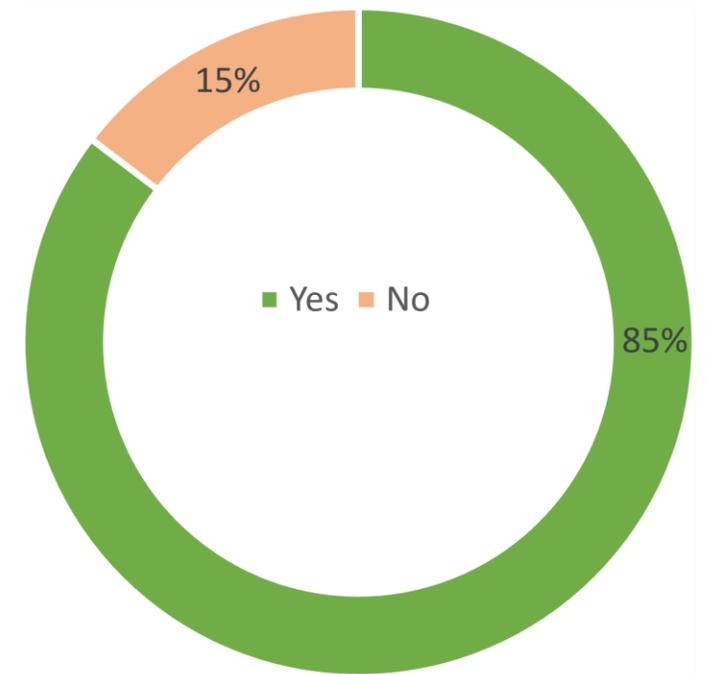
**A** Motivation to Continue Separate Waste Collection



**B** Additional Time / Day for Separate Collection



**C** Recommendation of Project to Others



# Separate collection for recycling: savings

Annual waste University of Konstanz:  
2.1 t of PP  
2.5 t of PS  
= 12.7 t CO<sub>2</sub> eq. for incineration  
only 1.6 t CO<sub>2</sub> eq. for recycling\*

Annual global savings potential:  
81% of plastic waste is PP & PS  
5.5 Mio t plastic waste  
→ 7.36 Mio t CO<sub>2</sub> eq. savings when recycled

Soon to come:

**From waste to resource: The untapped value of the separate collection of single-use laboratory plastics enabling recycling**

Bianca R. Schell<sup>1,#a</sup>, Ann-Katrin Emmerich<sup>2</sup>, Arooba Nazneen<sup>2</sup>, Marc Widenmeyer<sup>2</sup>, Anke Weidenkaff<sup>2</sup>, Nico Bruns<sup>1,\*</sup>

\*calculations based on End-of-Life scenario at Uni Konstanz: incineration in Switzerland  
\*\* calculations based on European incineration



# Thank you! Questions?

Bianca Schell

[bianca.schell@uni-konstanz.de](mailto:bianca.schell@uni-konstanz.de)



**Nachhaltigkeit**  
Universität Konstanz

