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Ph.D. thesis (2024-2027)
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NAPKINS, Structure-properties relationships of wet and dry fiber foam for absorbent and retentive sanitary pads

NAPKINS, étude propriétés-structures des mousses fibreuses liquides et solides pour la fabrication de mousses absorbantes et rétentives

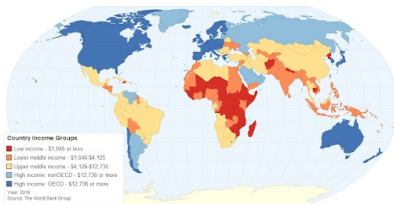
MatBio

Context

Develop **100% bio-based & biodegradable napkins** to replace petro-based veils & non-biodegradable super absorbent particles (SAP) that slowly break down in landfills^[1]



Affordable and produced locally from **local biomass** in different part of the world to help overcome limited access, detrimental health and social consequences for menstruated people in the Global South^[2]

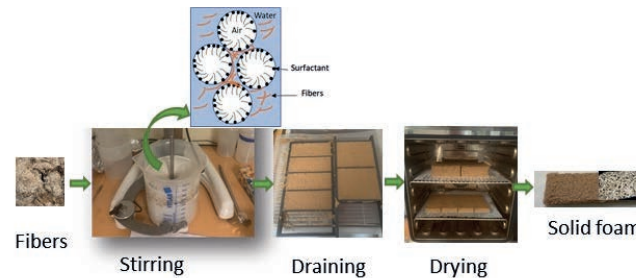


[1] C. Lacoste et al. (2019), doi: 10.1016/j.eurpolymj.2019.03.013.
[2] M. Panjwani et al., (2024) doi: 10.1007/s13399-023-04688-7.

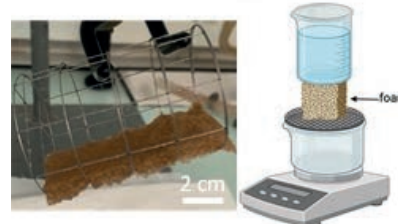
Objectives

Study the influence of surfactant and fibers physico-chemistry on retention

- Surfactants: Glucopon 600CS/UP215, Texapon V95G, SDS
- Annual plant fibers: Cotton (reference), Bamboo, Banana stem, Flax, Date palm



Water retention after 5 kPa load ~ commercial > 16 g/g with water



Methods

Surfactant and fibers suspensions

- Fibers morphology (Morphi)
- Mechanical properties of fibers
- Dynamic and static surface tension (Pendant drop/bubble tensiometry)
- Surface dilatational modulus (Oscillating pendant drop)
- Viscoelasticity (rotational rheometer)

Liquid foam

- Bubble size distribution
- Air fraction
- Half life
- Viscoelasticity



Solid foam

- Porosity, pore size
- Mechanical properties
- Absorbance
- Retention

