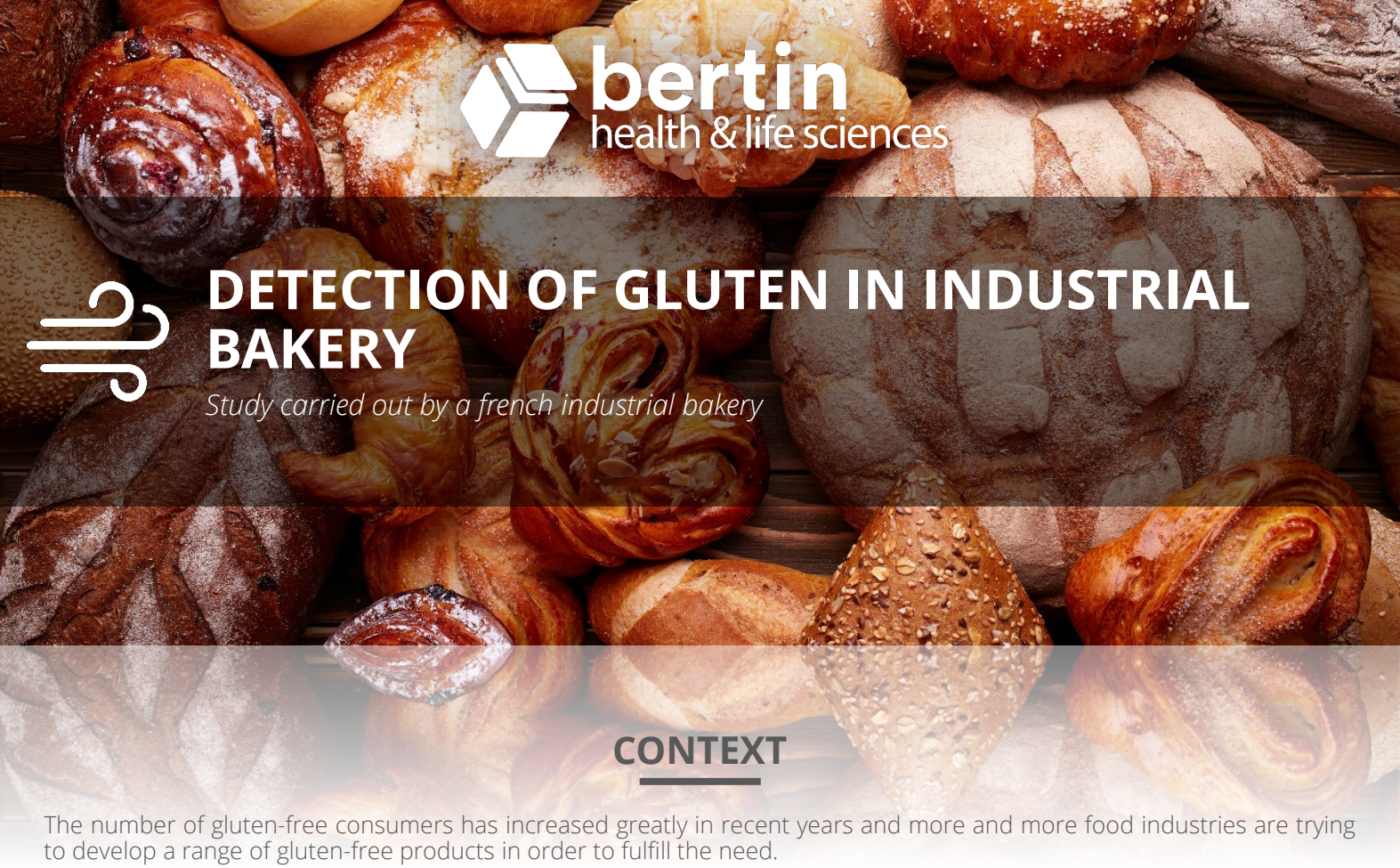

DETECTION OF GLUTEN IN INDUSTRIAL BAKERY

Study carried out by a french industrial bakery

CONTEXT

The number of gluten-free consumers has increased greatly in recent years and more and more food industries are trying to develop a range of gluten-free products in order to fulfill the need.

This study is aimed at evaluating the level of gluten contamination in a 2000m3 production workshop in an industrial bakery. The objective was to create a specific area in the production workshop dedicated to the production of gluten-free products.

The Coriolis® Micro has been used to perform air sampling at various points in the bakery during production and also when the machines were stopped. The samples have been then analyzed by ELISA.

MATERIALS & PROTOCOLS

Materials

- Air sampler: Coriolis® Micro, sterile cones
- Collection liquid: 15 mL of distilled water

Protocols

- *First sampling area (A1)*

This area has been emptied out of all products containing gluten before the sampling, but gluten residues still remain in the air. Sampling at 300 L/min for 10 and 20 min when the machines were stopped and during production time

- *Second sampling area (A2)*

Raw materials containing gluten are continuously used in this area. Sampling at 300 L/min for 10 and 20 min and at 200 L/min for 5 min during production time

Liquid air samples analyzed by R5-Mendez ELISA (external laboratory)

CONTACT
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DETECTION OF GLUTEN IN INDUSTRIAL BAKERY

RESULTS

Results of the air sampling performed in the first area

Sampling parameters	[Gluten] (mg of gluten/kg of liquid collection)	[Gluten] (mg of gluten/m^3 of air)	Results
Control (distilled water)	<5 ppm	-	OK
A1-300L/min-20 min Machines stopped	**<5 ppm**	< 0,075 mg de gluten/6000L of air < 12,5 µg de gluten/m3 of air	Low gluten contamination
A1-300L/min-10 min Machines stopped	**<5 ppm**	< 0,075 mg de gluten/3000L of air < 25 µg de gluten/m3 d'air	
A1-300L/min-20 min Production time	**<5 ppm**	< 0,075 mg de gluten/6000L of air < 12,5 µg de gluten/m3 of air	Low gluten contamination
A1-300L/min-10 min Production time	**8 ppm**	0,12 mg de gluten/3000L of air 40 µg de gluten/m3 of air	Increase of the level of gluten during the production

The level of gluten detected with Coriolis® Micro in this area is at the detection limit of the analysis method. An increase of the gluten concentration is observed when the sampling is performed during the production. This moderate increase has to be confirmed by further trials.

Results of the air sampling performed in the second area

Sampling parameters	[Gluten] (mg of gluten/kg of liquid collection)	[Gluten] (mg of gluten/m^3 of air)	Results
A2-300L/min-20 min Production time	**35 ppm**	0,525 mg de gluten/6000L of air 87,5 µg de gluten/m3 of air	Detection of gluten at a high concentration -> the production of gluten-free products close to this area is not possible
A2-300L/min-10 min Production time	**54 ppm**	0,81 mg de gluten/3000L of air 270 µg de gluten/m3 of air	
	44 ppm	0,66 mg de gluten/3000L of air 220 µg de gluten/m3 of air	
A2-200L/min-5 min Production time	**18 ppm**	270 µg de gluten/m3 d'air	

During the production, the level of gluten detected in the area is high. The installation of a gluten-free production line close to this area is not possible because of the high risk of cross-contamination.

CONCLUSION

Thanks to its high flow rate, Coriolis® Micro is a valuable tool for the collection of gluten even in a low-contaminated environment. Coriolis® Micro can be used by food industries for quality control, in particular, to check the level of gluten in the atmosphere of gluten-free production areas.

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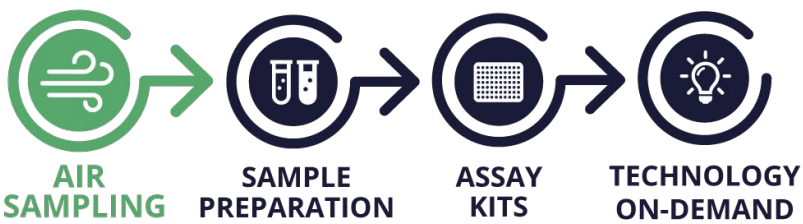

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