

**INTEGRATED ELECTROKINETIC MAGNETIC BEAD-BASED ELECTROCHEMICAL
IMMUNOASSAY ON MICROFLUIDIC CHIPS FOR RELIABLE CONTROL OF
PERMITTED LEVELS OF ZEARALENONE IN INFANT FOODS**

**SUPPORTING INFORMATION
(For publication)**

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Table S1. Optimization of the volume of modified magnetic beads

Beads volume (μL)	Signal (nA)
0.1	9.0
0.2	11.0
0.5	8.3
1.0	4.5
2.0	2.1

Table S2. Analytical signals (nA) obtained during the optimization of electrokinetic injection of substrate and electrochemical mediator.

Injection time (s)	Injection potential (V)			
	1500	2000	2500	3000
10	0.0	0.0	3.5	7.6
20	0.0	3.5	5.1	13.0
40	5.1	7.8	7.1	10.6
60	6.5	8.7	10.0	N.D.
80	6.9	N.D.	N.D.	N.D.

N.D.: distorted and broad peak.

Table S3. Optimization of electrokinetic flow rate.

Driving potential (V)	Signal (nA)	Migration time (s)
1000	6.5	700
1250	9.3	465
1500	10.7	281
1750	9.4	215

Table S4. Optimisation of the sample/tracer injection time for the immunological interaction¹.

Injection time (s)	Signal (nA)
3	2.0
6	4.1
8	8.4
10	8.0

¹Incubation time was fixed to 420 s.

Table S5. Optimization of the incubation time for the immunological interaction¹.

Incubation time (s)	Signal (nA)
60	N.D.
300	8.4
360	14.1
420	15.0

¹Injection time was fixed to 8 s.

Table S6. Determination of ZEA under permitted levels in infant liquid (milkshake) and solid foods (powdered) ¹

Maximum signal ² (nA)	Reference signal ³ (nA)	Liquid sample signal (nA)	ZEA concentration ($\mu\text{g L}^{-1}$)	Recovery (%)
14.1	6.5	12.0	10.8	108
15.9	6.7	12.5	10.7	107
17.7	6.1	11.2	10.9	109
15.9±1.8	6.4±0.3	11.9±0.6	10.8±0.1	108±1
Maximum signal ² (nA)	Reference signal ⁴ (nA)	Solid sample signal (nA)	ZEA concentration ($\mu\text{g L}^{-1}$)	Recovery (%)
19.6	16.1	18.2	0.88	176
21.1	16.8	18.5	0.90	180
22.4	16.4	18.3	0.89	178
21.0±1.0	16.4±0.4	18.4±0.2	0.89±0.01	178±2

¹ Spiked at $10 \mu\text{g L}^{-1}$ (For the solid sample, the final concentration was $0.5 \mu\text{g L}^{-1}$). ² Maximum signal obtained for non-spiked ZEA. ³ Reference signal obtained for $20 \mu\text{g L}^{-1}$ of ZEA standard for milkshake (liquid sample). ⁴ Reference signal obtained for $1 \mu\text{g L}^{-1}$ of ZEA standard for powdered (solid sample).