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## Introduction

To ensure the reliability and performance of the DR CALUX® bioassay by BDS for monitoring food and feedingstuffs, international interlaboratory comparison studies are mandatory<sup>1</sup>.

In the present paper, the results of the international interlaboratory comparison study, using DR CALUX® by BDS (BICS 2011) are described. A total of 12 laboratories worldwide using the CALUX bioassay in house participated in the BICS-2011 study. The inter-laboratory calibration study consisted of 3 meat samples supplied by BDS.

## Methods and materials

Three pork meat samples were prepared at 3 different PCDD/PCDF/dl-PCB levels (0,5; 1.2 and 14 pg WHO-TEQ/g fat) which were sent for GC/HRMS analysis (0,67; 1.3 and 13 pg WHO-TEQ/g fat). The total TEQ content in the 3 pork meat samples showed to be for one sample (A) well below the level of interest (maximum EU level for PCDDs/PCDFs/dl-PCBs in pork meat is 1.5 pg PCDD/F/dl-PCB TEQ/gr fat), for another sample (B) just below the level of interest and for the third sample (C) well above the level of interest (see table 1). For calculating the TEQ value of the chemical HRGC/HRMS analysis the TEF (1998) have been used. Therefore, meat sample A and B can be considered as negative whereas meat sample C can be considered as positive.

A total of 12 laboratories located world-wide participated in the BICS-2011 study. Ten of the laboratories invited are using the DR CALUX® and two are using CALUX bioassay in house for screening purposes of food and feed materials. The participants were asked to deliver the results in the calculation files provided by the organizer for evaluation of results. Only results that met the performance criteria of the CALUX bioassay were taken into account (maximum induction  $\geq 6$ ; RSD triplicate analysis  $\leq 15\%$ ; R2 of the fit  $\geq 0.98$ ; reported analysis results  $> 1$  pM TEQ/well).

## Results and discussion

In table 1, a summary of the CALUX analysis results obtained for the meat samples are given:

Table 1: Summarized CALUX analysis results in pg TEQ/g fat of the BICS 2011 study.

	Meat A	Meat B	Meat c
Study assigned parameters for calculation			
$x^*$	0.53	1.2	13
$s^*$	0.31	0.62	6.4
Additional parameters			
Average***	0.59	1.2	13
Stdev	0.42	0.56	6.3
RSD(%)	71	48	48
Median***	0.46	1.2	14
HRGCMS (WHO-1998) pgTEQ/g fat	0.67	1.3	13

The participants were asked to extract, clean-up and determine the total TEQ content by CALUX analysis. Most of the laboratories were following the basic principles of the EC/1883/2006 guideline and the performance criteria's for cell based screening methods.

In table 2, sample CALUX analysis results are classified as negative or suspect. Following evaluation of the analysis results, it can be concluded that no false negative results were reported.

In figure 1, the z-scores for all participants and all samples tested are given. Thirty four z-scores were calculated of which 2 where above a score of [22] (representing 3% of the results).

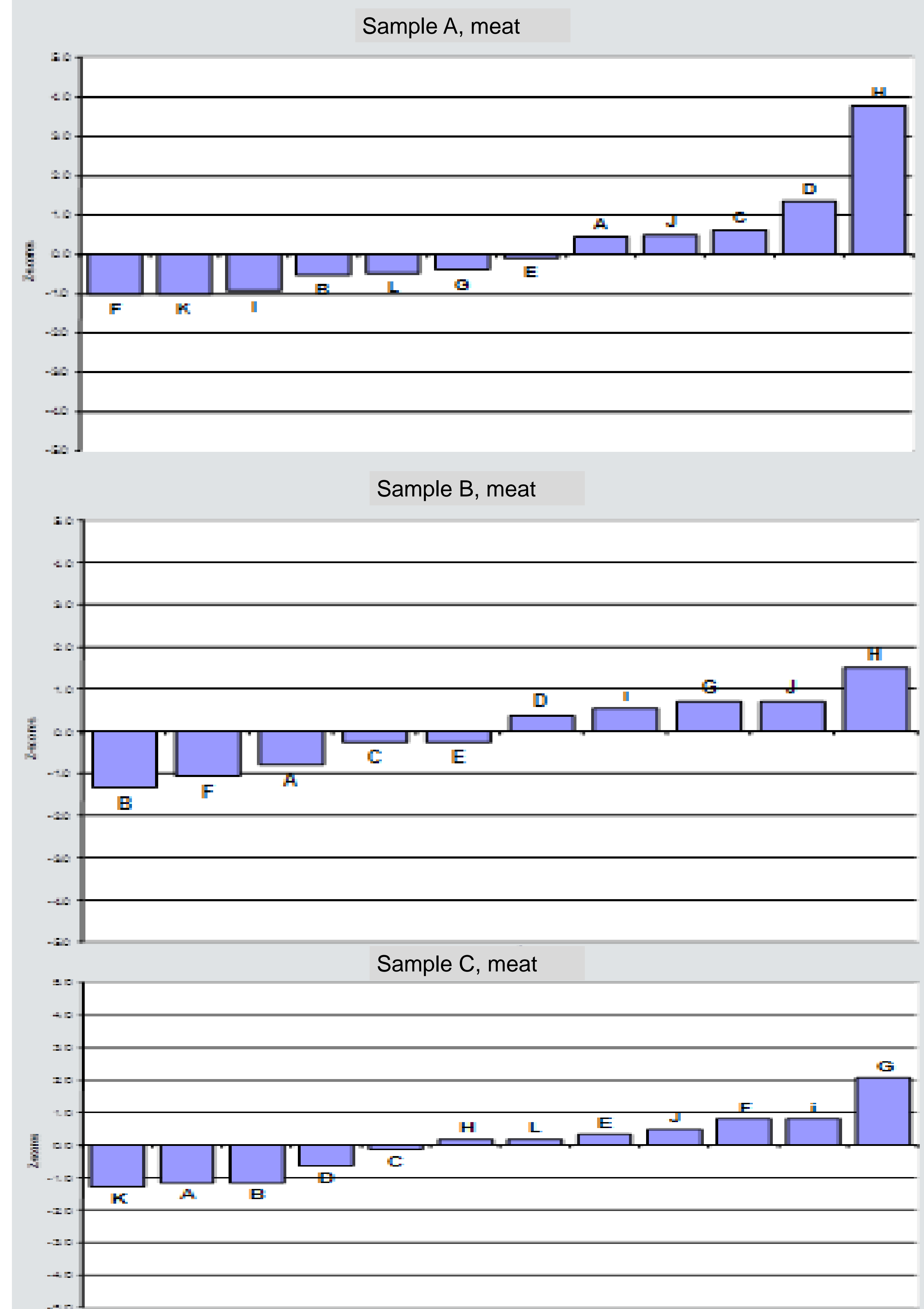
## References

<sup>1</sup> Besselink H, Jonas A, Pijnappels M, Swinkels A, Brouwer B. (2004). Organohalogen Compounds; 66:677-681

Table 2: Classification of analysis result. Sample is classified negative in case the analysis result is more than 25% below the maximum EU limit for PCDDs/PCDFs/dl-PCBs in pork meat.

	laboratory	Meat A	Meat B	Meat C
LAB	A	negative	negative	suspect
	B	negative	negative	suspect
	C	negative	negative	suspect
	D	negative	suspect	suspect
	E	negative	negative	suspect
	F	negative	negative	suspect
	G	negative	suspect	suspect
	H	suspect	suspect	suspect
	i	negative	suspect	suspect
	J	negative	suspect	suspect
	K	negative	n.a.	suspect
	L	negative	n.a.	suspect
HRGCMS (WHO-1998)		negative	negative	positive

Figure 1. Graphical representation participants z-scores for all 3 pork meat samples



## Conclusions

The results of this study show that the DR CALUX® bioassay for screening of dioxin and dioxin-like PCBs in meat samples is a reproducible and reliable tool to separate compliant from suspected samples. Also the differences between the GC/HRMS analysis and CALUX have been in the range of typical measurement uncertainties in this low concentration range.