

RANDOX
FOOD DIAGNOSTICS

Feed & Food Analysis



Better Science, Safer Food

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Helping Improve the Agricultural Industry

Commitment to research and development is the driving force behind our innovative technology, allowing Randox Food Diagnostics to become a global leader in screening for toxins and residues within feed and food. With a comprehensive range of testing solutions and validations across a range of matrices, we are changing the face of food safety and quality worldwide.

Over 35 years, Randox Food Diagnostics has developed a specific product portfolio including ELISA and Randox's patented Biochip Array Technology to suit the needs for feed and food screening. Putting the food and agricultural industries at the forefront of what we do has allowed Randox Food to become the industries trusted supplier of the most innovative technology within feed and food screening. Biochip Array Technology allows users to save time, consolidate costs and gain accurate results.

We offer screening solutions within feed and cereals for the following:

- Mycotoxins
- Coccidiostats
- Growth Promoters
- Antimicrobials

Biochip Array Technology

Randox's patented Biochip Array Technology (BAT) provides multiple results from a single, undivided sample with accurate and trusted results on a 9x9mm ceramic Biochip. Our unique technology is at the forefront of testing and provides a large number of results in less time when compared to other methods.

Randox's comprehensive test menus allow for the screening of multiple sample types, providing semi-quantitative results. These versatile arrays are ideal for the screening of feed and food, giving you the ability to accurately detect toxins and residues using a single platform. This technology ultimately provides a more informed decision on confirmatory analysis required.

Benefits



Simultaneous Detection

Multiplex testing facilitates simultaneous screening of mycotoxins and drug residues in feed and food samples.



Excellent Sensitivity

Unrivalled multi-analyte detection of contaminants to fulfil global regulatory requirements with qualitative and semi-quantitative formats available.



Higher Throughput

The Biochip can assess up to 45 samples in under three hours using the semi-automated Evidence Investigator.

Multiplex Explained

Randox's patented Biochip Array Technology (BAT) is based upon a competitive immunoassay format but provides multiple results from a single sample. BAT utilises a nano-spotting technique to create a versatile array which can accommodate 21 discrete test regions (DTRs).

Each DTR is coated with a single high quality, engineered antibody which is used to detect the presence of multiple compounds. Multiplex screening increases the throughput of testing, greatly reduces labour requirements and provides unrivalled test consolidation.

Key



Discrete test region



Quality control spot



5x5 Biochip Surface



21 discrete test regions on each biochip for individual analytes

Evidence Investigator

The Evidence Investigator is a compact, semi-automated benchtop analyser. Utilising the revolutionary Biochip Array Technology (BAT), the Evidence Investigator is a multi-analyte, semi-quantitative analyser. Using BAT, the Evidence Investigator ensures that screening feed and food for toxins and drug residues is accurate and efficient, offering laboratories comparable results to that of LC-MS/MS and other confirmatory methods.



Analyser Process

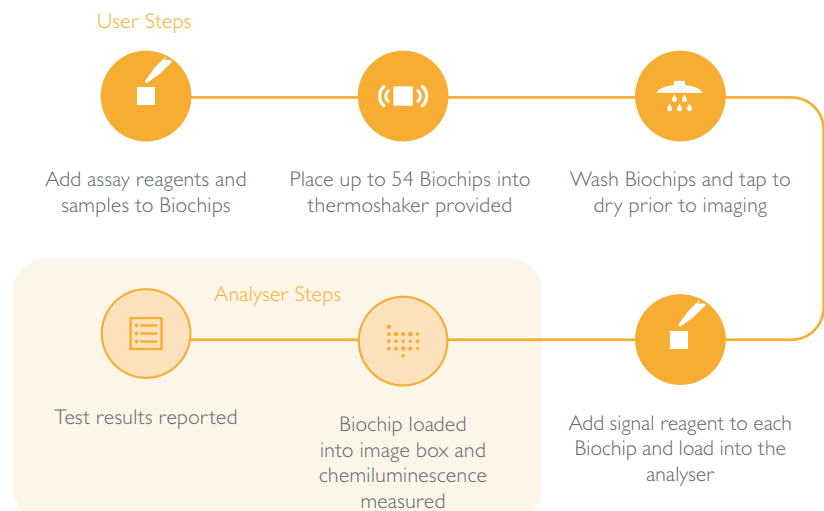




Image Processing

The analyser uses unique image processing software to translate the Relative Light Units (RLU) generated from the chemiluminescent reactions into a qualitative or semi-quantitative result.



On Board Data Analysis

No manipulation of results is required, reducing scope for operator error. The Evidence Investigator provides excellent sensitivity with either a semi-quantitative or qualitative result for each analyte.



Multiplex Technology

Using multiplex technology, the Evidence Investigator can provide simultaneous detection for a wide range of analytes from a single sample.



True Cost Reduction

Multiplex testing reduces the amount of time and labour spent on individual tests as well as associated laboratory costs.

Technical Snapshot

Analyser Description	Semi-automated Biochip Array analyser
Dimensions	750 (h) x 480 (d) x 420 (w) mm
Weight	24kg / 52.9lbs
Biochip Format	1 x Biochip carrier (Holds 9 individual Biochips)
Maximum Throughput	45 samples in 2 hours 30 minutes*
Accreditation	Internally accredited to full CE & UL certification
Measurement Principal	Competitive techniques with chemiluminescent reaction

*can be increased with multiple thermoshakers (Cat No. EV700-997)

Mycotoxin Analysis

Mycotoxins are a group of naturally occurring toxins produced as secondary metabolites by certain moulds. They can occur in a variety of different crops and are estimated to be responsible for losses of 5-10% of crop production globally. Moreover, mycotoxin occurrence patterns are constantly changing around the world, due to climate change causing extreme weather conditions.

Consumption of mycotoxins can result in significant adverse health effects in humans and animals and as a result, international food standards recommend that food producers conduct regular routine screening for mycotoxins.

Why Test for Multiple Mycotoxins?

Recent, reliable studies have been published showing that, when 21,709 samples of various crops were tested, the majority of samples contained multiple mycotoxins. The combination of multiple mycotoxins has detrimental effects on human health, these mycotoxins can also affect various animal species causing lowered production rates and significant economic losses.



**67% of 21,709 samples
showed a presence of more
than one mycotoxin.**

Biomin 2020, Published in 2021.

Mycotoxin Biochip Arrays

Randox Food Diagnostics have developed a range of screening arrays to allow multiple detection of groups of mycotoxins from a single sample. All Randox Food's mycotoxin tests are simple to use and require a single step liquid to liquid extraction method, removing the need for multiple extraction procedures.

Validated Matrices

We provide mycotoxin testing for the following matrices within our Biochip product range.

Cereal based animal Feed (complete)	Rapeseed
Sugar Beet	Rye
Corn / Maize	Soya
Barley	Wheat
Cotton Seed	Oat
Sunflower Seed	-

Validated in accordance with Commission Decision 2002/657/EC and Commission Regulation (EU) No 519/2014. Further evaluated matrices available on request.

Advantages of Multiplex Testing

- Detection of multiple mycotoxins from a single sample, using a single step liquid to liquid extraction method
- Increased detection capacity
- Reduced number of samples for confirmatory analysis
- Reduced cost analysis
- Reduced labour load, laboratory consumables and storage requirements

FAPAS

Randox Food Diagnostics is a regular participant in the FAPAS proficiency testing scheme for mycotoxins. FAPAS is the largest and most comprehensive analytical chemistry proficiency testing scheme in the food sector. The scheme has more than 2000 participants in over 100 countries.

Proficiency testing is an independent, confidential check of a laboratory's performance and usually involves participating laboratories running one 'blind' sample that is provided by the proficiency testing company. Each laboratory is given a number as their reference.

The aim is to get as close a score to the assigned value as possible. This is presented on a Z-Score scale, where the value is a perfect 0.

Case Study

Test material from the scheme was assessed with Randox Food Diagnostics' mycotoxin Biochip Array for ochratoxin A (OTA).

An assigned value was determined for the analyte and, in conjunction with the standard deviation for proficiency, was used to calculate a z-score for a result.

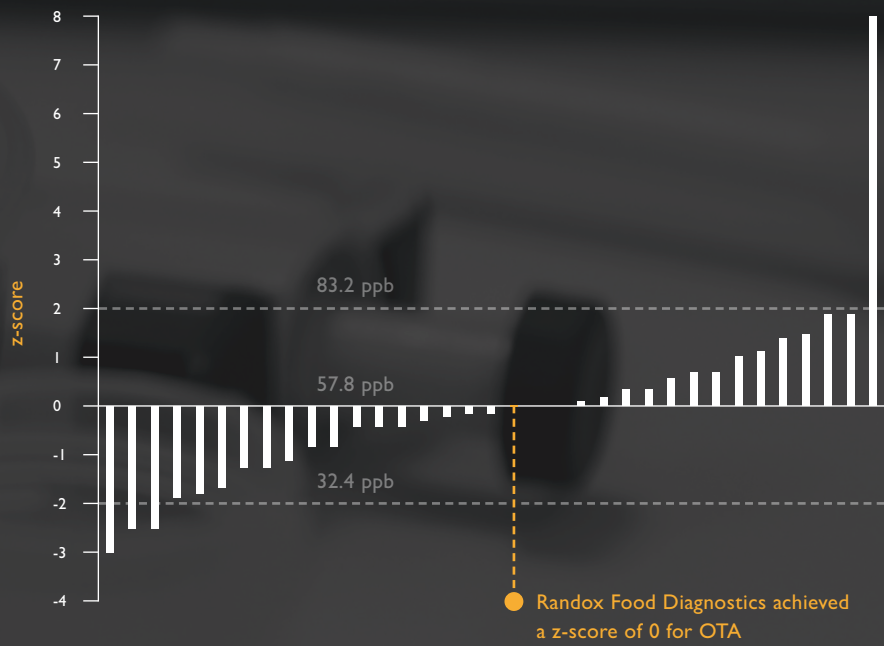
With 35 laboratories participating in this study, Randox Food Diagnostics achieved a perfect score of 0, scoring higher than the majority of participants including multiple confirmatory systems.

Results

Analyte	Z-Score	Assigned Value (ppb)	Result (ppb)	LOD (ppb)
OTA*	0	57.8	57.2	0.4

*FAPAS sample number 17146

Z-Scores for OTA



Radox Food Diagnostics regularly take part in various proficiency tests for multiple analytes on our mycotoxin arrays, these are available upon request.

Myco 9 Array

Available on Evidence Investigator

Catalogue No: EV3941

Samples per Kit: 45

Sample Prep: 30 mins

Assay Time: 2 hours

Kit Format: Biochip

Reported Result: ppb

LOD Key

 Cereals

Mycotoxin Arrays

Assay	LOD (ppb)		Compound	%CR
Aflatoxin B1	0.25		Aflatoxin B1*	100
			Aflatoxin B2	18
			Aflatoxin G1	15
			Aflatoxin G2	3
Aflatoxin G1	0.50		Aflatoxin G1*	100
			Aflatoxin G2	71
			Aflatoxin B1	8
			Aflatoxin B2	5
Deoxynivalenol	80.00		DON*	100
			3-Acetyl-DON	723
			15-Acetyl-DON	3
			DON-3-Glucoside	91
Diacetoxyscirpenol	20.00		Diacetoxyscirpenol*	100
Fumonisin	175.00		Fumonisin B1*	100
			Fumonisin B2	91
			Fumonisin B3	100
Ochratoxin A	0.40		Ochratoxin A*	100
Paxilline	5.00		Paxilline*	100
T2/HT2 toxins	7.00		T2 toxin*	100
			HT2 toxin	100
Zearalenone	5.00		Zearalenone*	100
			α -Zearalenol	114
			β -Zearalenol	69
			Zearalanone	65
			α -Zearalanol	51
			β -Zearalanol	52

*Each LOD standardised to this compound

Myco 7 Array

Available on Evidence Investigator

Catalogue No: EV4065

Samples per Kit: 45

Sample Prep: 30 mins

Assay Time: 2 hours

Kit Format: Biochip

Reported Result: ppb

LOD Key

C Cereals

Assay	LOD (ppb)		Compound	%CR
Aflatoxin B1	0.25	C	Aflatoxin B1*	100
			Aflatoxin B2	18
			Aflatoxin G1	15
			Aflatoxin G2	3
Aflatoxin G1	0.50	C	Aflatoxin G1*	100
			Aflatoxin G2	71
			Aflatoxin B1	8
			Aflatoxin B2	5
Deoxynivalenol	80.00	C	DON*	100
			3-Acetyl-DON	723
			15-Acetyl-DON	3
			DON-3-Glucoside	91
Fumonisin	175.00	C	Fumonisin B1*	100
			Fumonisin B2	91
			Fumonisin B3	100
Ochratoxin A	0.40	C	Ochratoxin A*	100
T2/HT2 toxins	7.00	C	T2 toxin*	100
			HT2 toxin	100
Zearalenone	5.00	C	Zearalenone*	100
			α -Zearalenol	114
			β -Zearalenol	69
			Zearalanone	65
			α -Zearalanol	51
			β -Zearalanol	52

*Each LOD standardised to this compound

Myco 6 Array

Available on Evidence Investigator

Catalogue No: EV4445

Samples per Kit: 45

Sample Prep: 30 mins

Assay Time: 1 hour 15 mins

Kit Format: Biochip

Reported Result: ppb

LOD & Range Key

CN Corn

SA Soya

W Wheat

OS Oil Seeds

CO Cereal & Oil Based Feed

Updated Product

The Myco 6 multi-mycotoxin array for Biochip reduces analytical waiting time by 40% in comparison to the other Biochip mycotoxin arrays.

Sample preparation follows a single simple extraction protocol.

Assay	LOD (ppb)		Quantification Range (ppb)		Compound	%CR
Aflatoxin B1	1.00	CN	80	CN	Aflatoxin B1*	100
	1.50	SA	80	SA	Aflatoxin B2	25
	1.00	W	80	W	Aflatoxin G1	23
	1.50	OS	80	OS	Aflatoxin G2	4
	5.00	CO	400	CO		
Deoxynivalenol	150.00	CN	3,000	CN	DON*	100
	200.00	SA	3,000	SA	3-Acetyl-DON	865
	150.00	W	3,000	W	DON-3-Glucoside	88
	300.00	OS	3,000	OS	15-Acetyl-DON	5
	400.00	CO	15,000	CO		
Fumonisin	200.00	CN	12,000	CN	Fumonisin B1*	100
	200.00	SA	12,000	SA	Fumonisin B2	90
	200.00	W	12,000	W	Fumonisin B3	94
	200.00	OS	12,000	OS		
	800.00	CO	60,000	CO		
Ochratoxin A	2.00	CN	160	CN	Ochratoxin A*	100
	2.50	SA	160	SA		
	1.50	W	160	W		
	2.50	OS	160	OS		
	10.00	CO	800	CO		
T2/HT2 toxins	10.00	CN	500	CN	T2 toxin*	100
	10.00	SA	500	SA	HT2 toxin	100
	10.00	W	500	W		
	10.00	OS	500	OS		
	30.00	CO	2,500	CO		
Zearalenone	12.50	CN	1,600	CN	Zearalenone*	100
	20.00	SA	1,600	SA	α -Zearalenol	78
	12.50	W	1,600	W	β -Zearalenol	17
	12.50	OS	1,600	OS	Zearalenone	34
	75.00	CO	8,000	CO	α -Zearalanol	30
					β -Zearalanol	13

*Each LOD standardised to this compound

Mycoflex Array

Available on Evidence Investigator

Catalogue No: Custom

Samples per Kit: 45

Reported Result: ppb

A Fully Customisable Array

Select a minimum of two analytes or more to create your own Mycoflex Biochip (minimum order of 25 kits).

LOD Key

C Cereals

Assay	LOD (ppb)		Compound	%CR
Aflatoxin B1	0.25	C	Aflatoxin B1*	100
			Aflatoxin B2	18
			Aflatoxin G1	15
			Aflatoxin G2	3
Aflatoxin G1	0.50	C	Aflatoxin G1*	100
			Aflatoxin G2	71
			Aflatoxin B1	8
			Aflatoxin B2	5
Deoxynivalenol	80.00	C	DON*	100
			3-Acetyl-DON	723
			15-Acetyl-DON	3
			DON-3-Glucoside	91
Diacetoxyscirpenol	20.00	C	Diacetoxyscirpenol*	100
Fumonisin	175.00	C	Fumonisin B1*	100
			Fumonisin B2	91
			Fumonisin B3	100
Ochratoxin A	0.40	C	Ochratoxin A*	100
Paxilline	5.00	C	Paxilline*	100
T2/HT2 toxins	7.00	C	T2 toxin*	100
			HT2 toxin	100
Zearalenone	5.00	C	Zearalenone*	100
			α -Zearalenol	114
			β -Zearalenol	69
			Zearalanone	65
			α -Zearalanol	51
			β -Zearalanol	52

*Each LOD standardised to this compound

Drug Residue for Feed & Ce

Coccidiostats

Coccidiosis is a parasitic disease of animal intestinal tracts caused by coccidian protozoa. Symptoms usually include bloody droppings, weight loss and mortality in young chickens. To prevent infection, farmers may administer prophylactic antiprotozoal coccidiostats in feed, which increases the chance that coccidiostat residues are retained in both poultry, meat and eggs.

Randox Food Diagnostics now offers one of the most comprehensive tests on the market for the detection of coccidiostat residues. The coccidiostats array for Biochip provides screening and semi-quantitative detection of 10 different coccidiostats from a single sample of premixed and medicated final feed including the detection of 15 anticoccidials across 10 assays.

Testing reals

Growth Promoters

Growth promoters have been used by the livestock industry for over 30 years to improve an animal's ability to more efficiently utilize nutrients and produce leaner meat. Anabolic steroids along with ractopamine and other growth promoting steroids must also be monitored very carefully in meat and animal feed. Insufficient withdrawal periods, once an animal has been fed with feeds containing these drugs, can lead to contaminated meat entering the food chain.

As a result, the use of growth-promoting hormones in livestock production is either prohibited (European Union) or strongly regulated (e.g. USA, Canada and Australia). Compliance with these regulations is monitored by national monitoring programmes.

Antimicrobials

Antimicrobial compounds have been used in food production to treat and prevent infections and to function as growth promoters. However, serious health concerns exist about the presence of antimicrobial compounds in food and the development of antibiotic resistant strains of micro-organisms due to inappropriate use. As a result of these concerns, many countries have banned or limited the use of antimicrobials in food producing animals and have set maximum residue limits (MRLs).

Randox Food Diagnostics offer both Biochip Array Technology and ELISA test kits for the detection of antimicrobials in feed.

Antimicrobial Array II Plus

Available on Evidence Investigator

Catalogue No: EV4169 A/B

Samples per Kit: 45

Feed Preparation Kit Required (EV3724)

LOD Key

F Feed

Drug Residue Biochip Arrays

Assay	LOD (ppb)		Compound	%CR
Quinolones	10	F	Norfloxacin*	100
			Pefloxacin	84
			Enrofloxacin	76
			Ciprofloxacin	59
			Ofloxacin	57
			Enoxacin	54
			Pipemidic Acid	36
			Fleroxacin	32
			Levofloxacin	32
			Nadifloxacin	27
			Orbifloxacin	23
			Danofloxacin	20
			Marbofloxacin	16
			Oxolinic Acid	12
			Difloxacin	8
Ceftiofur	15	F	Ceftiofur*	100
			Desfuoylceftiofur	92
Thiamphenicol	15	F	Florfenicol*	100
			Thiamphenicol	53
Streptomycin	80	F	Streptomycin*	100
			Dihydrostreptomycin	99
Tylosin	10	F	Tylosin*	100
			Tilmicosin	37
Tetracyclines	10	F	Tetracycline*	100
			4-epitetracycline	87
			Rolitetracycline	67
			4-epioxytetracycline	52
			Oxytetracycline	52
			Chlortetracycline	51
			Demeclocycline	41
			Doxycycline	23
			4-epichlortetracycline	20
			Methacycline	11

*Each LOD (ppb) standardised to this compound

Coccidiostats Array

Available on Evidence Investigator

Catalogue No: EV4131 A/B

Samples per Kit: 45

Requires CCS Feed Preparation Kit (EV4131B)

LOD Key

FP Premixed Feed

FM Medicated Final Feed

Assay	LOD		Compound	%CR
Clopidol	125.000	FP	Clopidol*	100
	1.000	FM	Nequinat	135
Decoquinat	39.125	FP	Decoquinat*	100
	0.313	FM		
Diclazuril	5.500	FP	Diclazuril*	100
	0.044	FM	Clazuril	12
Halofuginone	1.625	FP	Halofuginone*	100
	0.013	FM		
Lasalocid	7.875	FP	Lasalocid*	100
	0.063	FM		
Maduramicin	2.375	FP	Maduramicin*	100
	0.019	FM		
Monensin	1.125	FP	Monensin*	100
	0.009	FM	Monensin A	89
Nicarbazin	0.625	FP	Dinitrocarbanilide*	100
	0.005	FM	Nicarbazin	98
Robenidine	25.000	FP	Robenidine*	100
	0.200	FM		
Salinomycin	2.000	FP	Salinomycin*	100
	0.016	FM	Narasin	130

*Each LOD standardised to this compound

LOD for feed samples measured in mg/kg

Growth Promoter
(Multiple Matrix Screen)

Available on Evidence Investigator

Catalogue No: EV3726

Samples per Kit: 45

Feed Preparation Kit Required (EV3724)

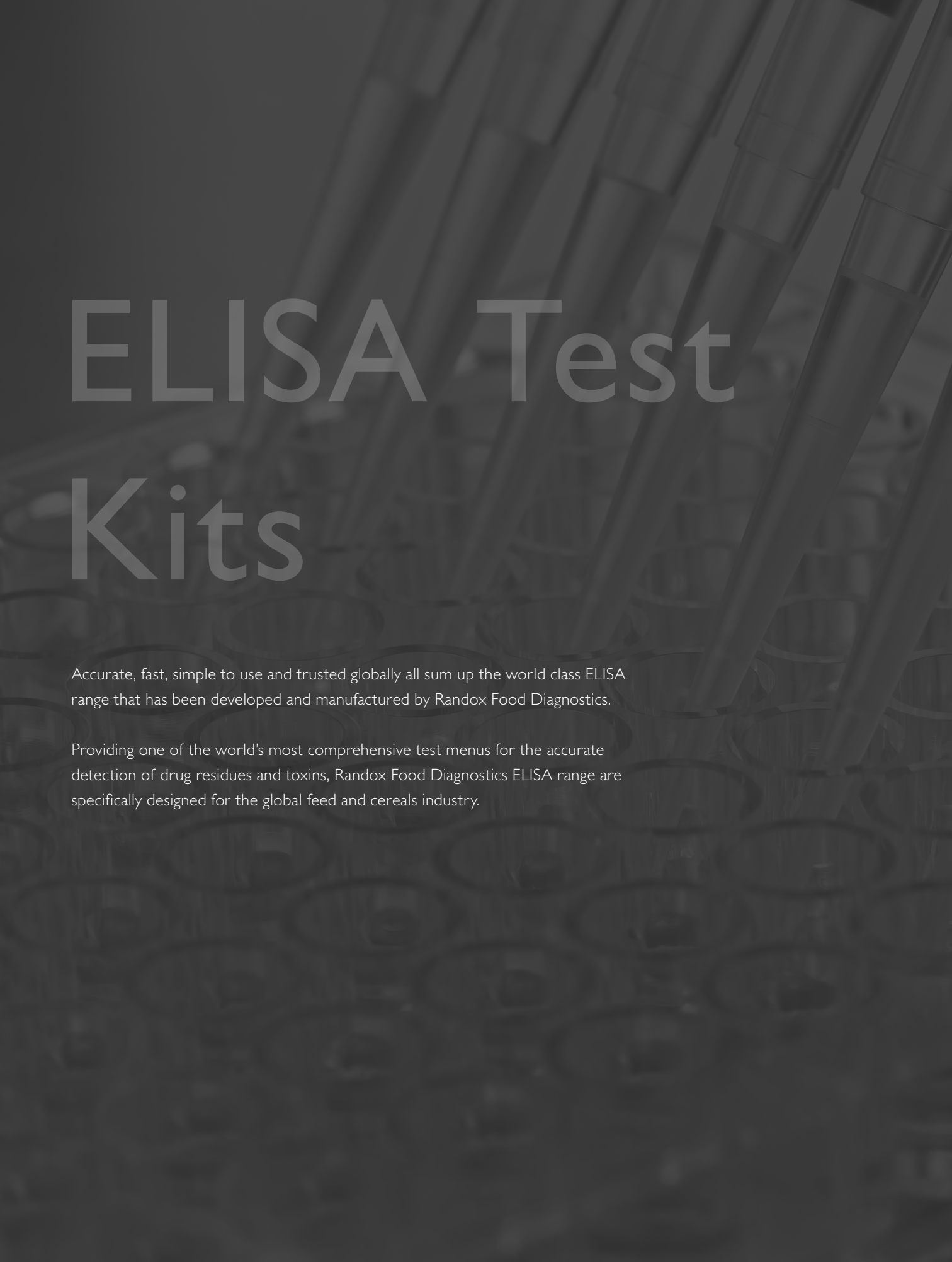
LOD Key

F Feed

Assay	LOD (ppb)		Compound	%CR
Beta-Agonists	8	F	Clenbuterol*	100
			Mapenterol	113
			Carbuterol	104
			Brombuterol	88
			Salbutamol	70
			Cimbuterol	54
			Mabuterol	41
			Terbutaline	22
			Methyl-clenbuterol	20
			Pirbuterol	15
Boldenone	140 Δ	F	17β - Boldenone*	100
			1,4-Androstadiene-3,17-dione	55
			17α - Boldenone	15
			Boldenone Glucuronide	15
Corticosteroids	10	F	Dexamethasone*	100
			Betamethasone 21 Acetate	133
			Flumethasone	57
			Betamethasone	31
			Dexamethasone 21 Acetate	27
Nandrolone	170 Δ	F	19-Nortestosterone (17β)*	100
			19-Nor-4-Androstene,3,17-Dione	143
			Trenbolone Acetate	109
			Trenbolone (17β)	70
			19-Nortestosterone (17β) Sulphate	55
			19-Nortestosterone (17α)	27
Ractopamine	2	F	19-Nortestosterone β Glucuronide	26
Ractopamine	2	F	Ractopamine*	100
			Ractopamine Hydrochloride	100
Stanozolol	9	F	Stanozolol*	100
			16β-Hydroxystanozolol	45
Stilbenes	25	F	Hexestrol*	100
			Diethylstilbestrol Glucuronide	289
			Diethylstilbestrol	105
			Dienestrol	72
Trenbolone	8	F	17β-Trenbolone	100
			17α-Trenbolone	21
Zearanol	15	F	Zearanol*	100
			α-Zearalenol	10
			β-Zearalenol	5.30

*Each LOD (ppb) standardised to this compound

Δ Further dilution may be required for quantification



ELISA Test Kits

Accurate, fast, simple to use and trusted globally all sum up the world class ELISA range that has been developed and manufactured by Randox Food Diagnostics.

Providing one of the world's most comprehensive test menus for the accurate detection of drug residues and toxins, Randox Food Diagnostics ELISA range are specifically designed for the global feed and cereals industry.

Ergot Alkaloids ELISA

ELISA Test Kit

Catalogue No: EA3491
Samples per Kit: 40
Ergot alkaloids accessory kit (EA10408)

LOD Key

- CB** Cereal Based Feed
- MP** Wheat, Spelt, Rye, Oats, Barley and Milling Products.

ELISAs

Assay	LOD (ppb)		Compound
Ergot Alkaloids*	50	CB	Ergotamine
	50	MP	Ergosine
			Ergosinine
			Ergocristine
			Ergocristinine
			α-and-β-Ergocryptine (sum)
			α-and-β-Ergocryptinine (sum)
			Ergocornine
			Ergocorninine
			Ergotaminine
			Ergometrine
			Ergometrinine

*Results are reported as the sum of the compounds listed.

The Randox Ergot Alkaloid ELISA is the only commercially available kit compliant with the lowest proposed maximum levels mandated by updated Commission Regulation (EU) 2021/1399. This is applicable from January 1st, 2022 for the total sum of 12 main ergot alkaloids.

Our ELISA is validated based on EU Commission Regulation 519/2014, as a semi-quantitative screening method for cereal-based feed, wheat, rye, oats, barley, spelt and their milling products.

Chloramphenicol FAST ELISA

ELISA Test Kit

Catalogue No: CN10171

Samples per Kit: 40

Assay	LOD (ppb)		Compound	%CR
Chloramphenicol FAST	0.20	F	Chloramphenicol	100
			Chloramphenicol	100
			Glucuronide	

β -Agonist ELISA

ELISA Test Kit

Catalogue No: SU2148

Samples per Kit: 40

Assay	LOD (ppb)		Compound	%CR
β -Agonist	5	F	Clenbuterol	100
	5.80	F	Salbutamol	86

Clenbuterol ELISA

ELISA Test Kit

Catalogue No: CB1418

Samples per Kit: 40

Assay	LOD (ppb)		Compound	%CR
Clenbuterol	5	F	Clenbuterol	100

Ractopamine ELISA

ELISA Test Kit

Catalogue No: RT3451

Samples per Kit: 40

Assay	LOD (ppb)		Compound	%CR
Ractopamine	2	F	Ractopamine	100

LOD Key

F Feed



1,000+

laboratories using Randox
Food Diagnostics technology

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