

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 54 samples in under three hours using the semi-automated Evidence Investigator.

Multiplex Explained

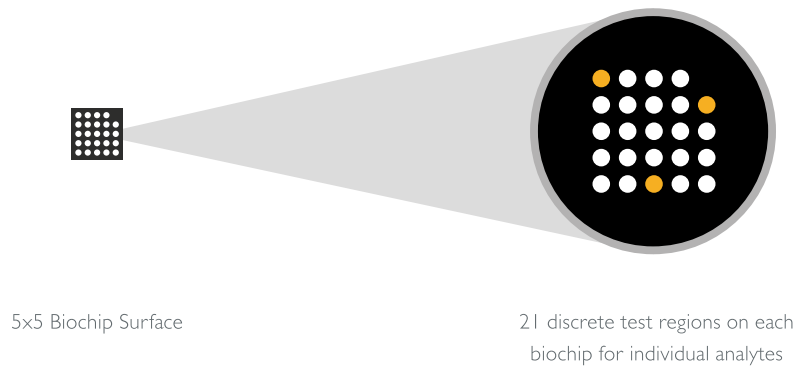
Randox's patented Biochip Array Technology (BAT) is based upon a competitive immunoassay format but provides multiple results from a single sample. BAT utilises a nano-spotting technique to create a versatile array which can accommodate 21 discrete test regions (DTRs).

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



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 drug residues is accurate and efficient, offering laboratories comparable results to that of LC-MS/MS and other confirmatory methods.



Analyser Process

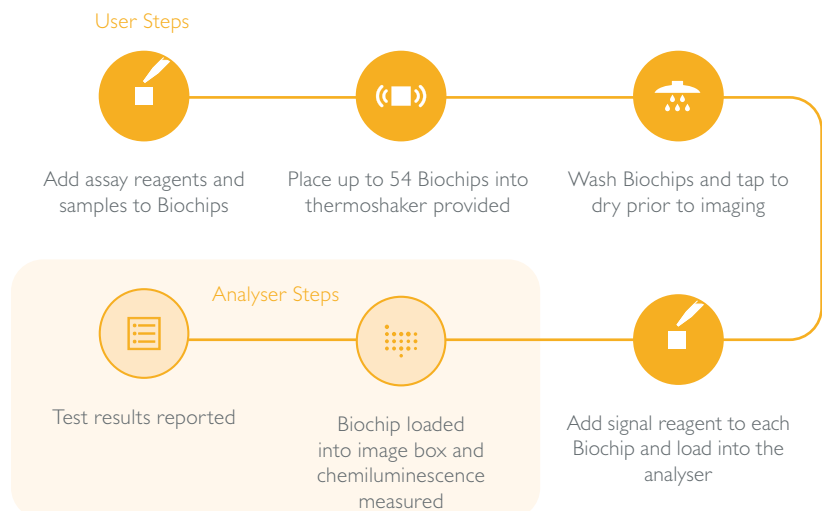




Image Processing

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	96 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 multiple 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 effect 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

Radox Food Diagnostics have developed a range of screening arrays to allow multiple detection of groups of mycotoxins from a single sample. All Radox 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 Myco array Biochip 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 simple 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

Radox Food Diagnostics is a regular participant in the FAPAS proficiency testing scheme for mycotoxins, which provides an independent check of a laboratory's performance to ensure the delivery of quality results. 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 are provided by the proficiency testing company. Each laboratory is given a number as their reference.

The aim is to get as close a score as possible on the Z-score scale, which is a perfect 0.

Case Study

Test material from the scheme was assessed with Radox 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.

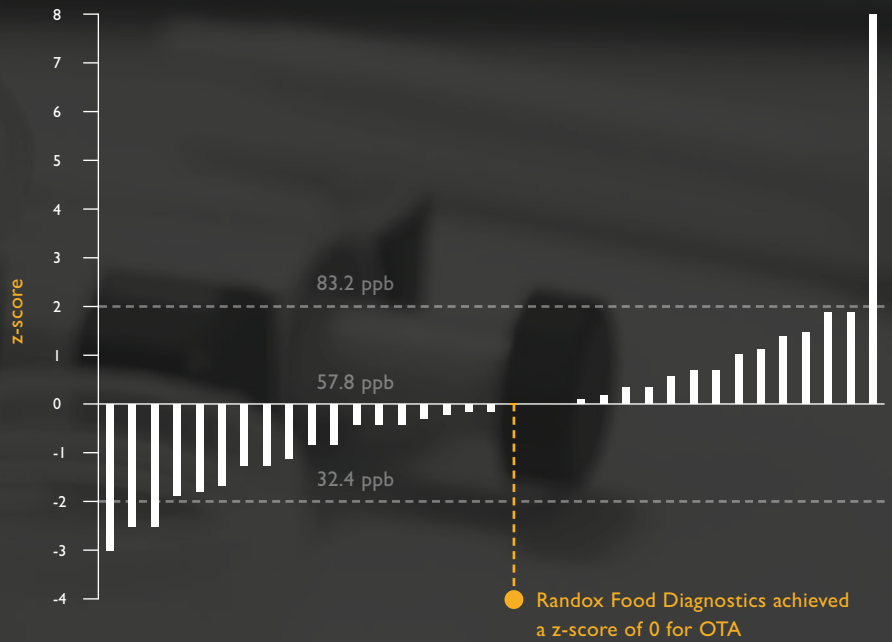
With 35 laboratories participating in this study, Radox Food Diagnostics achieved a perfect score of 0, scoring higher than the majority of participants.

Results

Analyte	Z-Score	Assigned Value (ppb)	Result (ppb)	LOD (ppb)
OTA*	0	57.8	57.2	3.125

*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.

Mycotoxin Arrays

Myco 9 Array

Available on Evidence Investigator

Catalogue No: EV3941

Tests per kit: 54 tests

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
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

Myco 7 Array

Available on Evidence Investigator

Catalogue No: EV4065

Tests per kit: 54 tests

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

Tests per kit: 54 tests

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	Zearalanone	34
	75.00	CO	8,000	CO	α-Zearalanol	30
				β-Zearalanol	13	

*Each LOD standardised to this compound

Myco 5 Array

Available on Evidence Investigator

Catalogue No: EV4137 A/B

Tests per kit: 54 tests

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	22
			Aflatoxin G1	13
			Aflatoxin G2	3
Aflatoxin G1	0.50	C	Aflatoxin G1*	100
			Aflatoxin G2	56
			Aflatoxin B1	9
			Aflatoxin B2	4
Deoxynivalenol	100	C	DON*	100
			3-Acetyl-DON	844
			15-Acetyl-DON	10
			DON-3-Glucoside	91
Ochratoxin A	0.25	C	Ochratoxin A*	100
			Ochratoxin B	2
Zearalenone	2.50	C	Zearalenone*	100
			α -Zearalenol	112
			β -Zearalenol	64
			Zearalanone	59
			α -Zearalanol	45
			β -Zearalanol	47

*Each LOD standardised to this compound

Mycoflex

Mycoflex Array

Available on Evidence Investigator

Tests per kit: 54 tests

Catalogue No: Custom

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

Mycotoxin ELISAs

Ergot Alkaloids ELISA

ELISA Test Kit

Catalogue No: EA3491

Tests per kit: 96 tests

Ergot alkaloids accessory kit (EA10408)

LOD Key

CB Cereal Based Feed

MP Wheat, Spelt, Rye, Oats,
Barley and Milling Products.

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 ELISA complies with the lowest proposed maximum levels mandated by new Commission Regulation (EU) 2021/1399. This is applicable from January 1st, 2022 for the total sum of 12 main ergot alkaloids.

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

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

Cat no: EV4169 A/B

LOD Key F Feed

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
		Pazufloxacin	7
Sarafloxacin	6		
Ceftiofur	15 F	Ceftiofur* Desfuroylceftiofur	100 92
Thiamphenicol	15 F	Florfenicol* Thiamphenicol	100 53
Streptomycin	80 F	Streptomycin* Dihydrostreptomycin	100 99
Tylosin	10 F	Tylosin* Tilmicosin	100 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
Feed Preparation Kit required (EV3724)

Growth Promoter (Multiple Matrix Screen)

Available on Evidence Investigator

Cat no: EV3726

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
1,4-Androstadiene-3,17-dione	55		
17 α - 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 (17 β)*	100
		19-Nor-4-Androstene-3,17-Dione	143
		Trenbolone Acetate	109
		Trenbolone (17 β)	70
		19-Nortestosterone (17 β) Sulphate	55
		19-Nortestosterone (17 α)	27
19-Nortestosterone β Glucuronide	26		
Ractopamine	2 F	Ractopamine*	100
		Ractopamine Hydrochloride	100
Stanozolol	9 F	Stanozolol* 16 β -Hydroxystanozolol	100 45
Stilbenes	25 F	Hexestrol*	100
		Diethylstilbestrol Glucuronide	289
		Diethylstilbestrol	105
		Dienestrol	72
Trenbolone	8 F	17 β -Trenbolone	100
		17 α -Trenbolone	21
Zearanol	15 F	Zearanol*	100
		α -Zearalanol	10
		β -Zearalanol	5.30

*Each LOD (ppb) standardised to this compound
 Δ Further dilution may be required for quantification
Feed Preparation Kit required (EV3724)

Coccidiostats Array

Available on Evidence Investigator

Cat no: EV4131A/B

LOD Key FP Premixed Feed FM Medicated Final Feed

Assay	LOD	Compound	%CR
Clopidol	125.00 FP	Clopidol*	100
	1.00 FM	Nequinat	135
Decoquinat	39.13 FP	Decoquinat*	100
	0.31 FM		
Diclazuril	5.50 FP	Diclazuril*	100
	0.04 FM	Clazuril	12
Halofuginone	1.63 FP	Halofuginone*	100
	0.01 FM		
Imidocarb	0.32 FP	Imidocarb*	100
	<0.01 FM		
Lasalocid	7.88 FP	Lasalocid*	100
	0.06 FM		
Maduramicin	2.35 FP	Maduramicin*	100
	0.02 FM		
Monensin	1.13 FP	Monensin*	100
	0.01 FM	Monensin A	89
Nicarbazin	0.63 FP	Dinitrocarbanilide*	100
	<0.01 FM	Nicarbazin	98
Robenidine	25.00 FP	Robenidine*	100
	0.20 FM		
Salinomycin	1.96 FP	Salinomycin*	100
	0.02 FM	Narasin	130
Toltrazuril	1.96 FP	Toltrazuril Sulphone*	100
	0.02 FM	Toltrazuril Sulphoxide	145
		Toltrazuril	7

*Each LOD standardised to this compound

LOD for feed samples measured in mg/kg

Requires CCS Feed Preparation Kit (EV4131B)

Chloramphenicol FAST ELISA

ELISA Test Kit

Cat no: CN10171

LOD Key F Feed

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

β -Agonist ELISA

ELISA Test Kit

Cat no: SU2148

LOD Key F Feed

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

Clenbuterol ELISA

ELISA Test Kit

Cat no: CB1418

LOD Key F Feed

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

Ractopamine ELISA

ELISA Test Kit

Cat no: RT3451

LOD Key F Feed

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

Local Engineers. Global Coverage

Randox Food Diagnostics provide customers with an unrivalled support service. A team of highly trained specialists are on-hand to deal with any technical and service issues you may have.



Global Offices

We have 25 international offices acting as direct points of contact for customers

100+
Specialists

Randox has over 100 engineers and tech support specialists placed around the world to ensure an efficient response to customer requests

700+

Scientists

Randox has over 700 scientists placed around the world, dedicated to providing a quality product offering



Global Distributors

We have official Randox Food Diagnostics technical distributors in over 100 countries



Aftercare

We offer the ultimate after-care support with tailored service packages to suit your available budget



1,000+
laboratories using Randox
Food Diagnostics technology

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