



الجمعية العربية لتربية النحل
Arab Beekeeping Association



RANDOX - A Company Profile

FOOD DIAGNOSTICS

- ✓ A **50 strong** workforce **passionate** about global food safety
- ✓ Consumer base has spread to **52 countries**, with over **130 instruments** installed
- ✓ **Every hour of every day**, **296** Randox Food tests are being carried out globally
- ✓ Investment in R&D has increased steadily & now **over 20** staff are dedicated to the development of new assays
- ✓ Since 2010 more than **130** dedicated assays covering 5 divisions 
- ✓ Distribution partnerships with **over 35** companies spanning more than **50** countries

Honey Screening Solutions

RANDOX
FOOD DIAGNOSTICS

مؤتمر الجمعية العربية لتربية النحل الأول
5 - 6 فبراير 2018م
مركز أبوظبي الوطني للمعارض - دولة الإمارات العربية المتحدة



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RANDOX - Globally Trusted Screening FOOD DIAGNOSTICS



The Food and Environment
Research Agency
Food and Environment Research
Agency
U.K



Food, Environmental and
Occupational Health &
Safety
France



Department of Quarantine
Indonesia



Austrian Agency for Health and
Food Safety
Austria



U.S. Department of
Agriculture
USA



Agriculture, Forestry &
Fisheries
South Africa



Ministry of Agriculture
Saudi Arabia



Department of Livestock
Development
Russia

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Honey Customers



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Background

- The Use of Antibiotic Drugs in Apiculture is globally restricted
- There are still no MRLs set for Antibiotics in Honey
- As Honey is seen as a 'Natural Product' consumers want for it to be antibiotic free
- Constant pressure on laboratories to ensure that there are little to no antibiotics present within Honey
- Analytically, exporters/ importers require certificates showing that each batch of honey is free of antibiotics

Testing

- Typically a certificate needs to be produced from a **confirmation laboratory** to show that the honey is free of antibiotics, or it is below a certain threshold
 - However some Honey Importers/ Exporters utilise internal screening methods in order to check the raw Honey from Bee keepers
- OR
- as a secondary check to ensure the Honey that they are receiving is as what is provided on the confirmation certificate
 - Randox produce a semi-quantitative Bench top system for the internal **screening** of Antibiotics within Honey



Current Placements



Revolutionary Screening Technology

The Evidence Investigator offers market leading screening technology to honey laboratories:

- **Quick Time Frame**
 - Results obtained within just a few hours
- **Cost Saving Element**
 - Compared to high ELISA volumes or analytical methods
- **Laboratory Efficiency Improved**
 - Results are multiplexed and significant time saving benefits are gained



Food Screening Solutions



Evidence Investigator and Biochip



ELISA



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Biochip Array Technology



A Multi-Residue Testing Platform

- Simultaneous Quantitative Detection
- One single sample
- Competitive ELISA Principles
- Efficient, accurate and cost effective

Typically a series of related residues are selected & grouped in an array format

Potential for 22 targets present on the Biochip allowing for large scale screening

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The Complete Honey Screening Package



Investigator Imaging
Module
(Bench Top System)



PC & Imaging
Software



Barcode
Scanner



Thermoshaker



Biochip Holding
Rack

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Additional Support Covered in System Package

- Randox will provide **on-site training** from a HQ based Installation Scientist (built into quotation)
- Normally this will be a **3 – 5 day** program depending on what Arrays are required at the site
- Full **1 year warranty** and 1 year 24 hour support if required
- **Online troubleshooting** also available remotely

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Radox Assistance

Radox Scientist will assist in:

- Setting up and initialising equipment
- Carrying out QC check on newly installed equipment
- Training on sample preparation
- Training on assaying technique
- Training on results reporting and interpretation
- Basic troubleshooting for equipment

Simple Assay Protocol



Add 50µl of prepared sample
and reagents to each Biochip



Use Thermoshaker to
incubate up to 54 samples



Rinse, tap and dry each
carrier prior to imaging



Add signal to each Biochip
and load onto the analyser



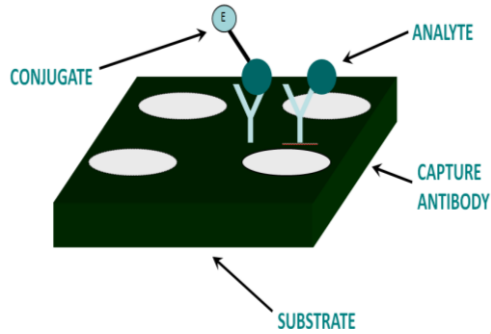
Image and result processing
on Evidence Investigator

Results are processed automatically using dedicated software



Competitive Immunoassay Format

- **Conjugate** – Known Analyte labelled with Horse Radish Peroxidase (HRP) Enzyme
- **HRP** – Reacts with Luminol and Peroxide to give off a light reaction
- **Light signal** inversely proportional to antigen concentration



Endpoint measurement

- 2 chemicals – **Luminol** and **Peroxide** generate light reaction
- Light is generated by **Chemiluminescence**
- **Charge Coupled Device** Camera captures images
- Investigator quantifies images using **Relative Light Units (RLU)** given off by each **DTR**
- **Correction** and **Reference Spots** used for image validation

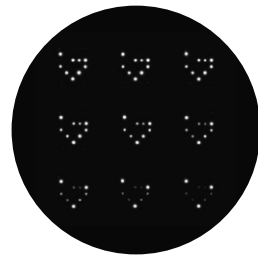
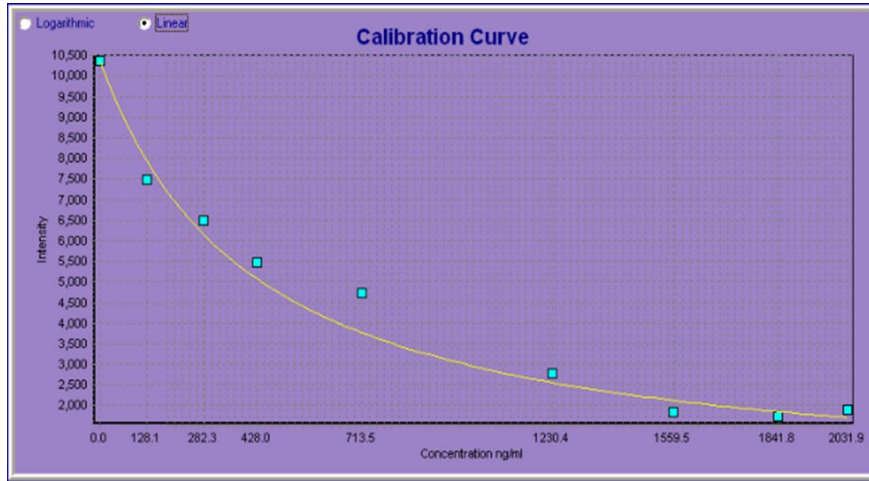




Image Quantification



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Image Quantification

Carrier	Sample	Date & Time	Cat Id	LIMS
✓	Plea. 4130	11.09.2011	0	
✓	Plea. 4139	11.09.2011	0	
✓	Plea. 4144	11.09.2011	0	
✓	Plea. 4145	11.09.2011	0	
✓	Plea. 4146	11.09.2011	0	
✓	Plea. 4147	11.09.2011	0	
✓	Plea. 4148	11.09.2011	0	
✓	Plea. 4149	11.09.2011	0	
✓	Plea. 4150	11.09.2011	0	
✓	Plea. 4151	11.09.2011	0	
✓	Plea. 4152	11.09.2011	0	
✓	Plea. 4154	11.09.2011	0	
✓	Plea. 4155	11.09.2011	0	
✓	Plea. 4156	11.09.2011	0	
✓	Plea. 4152	11.09.2011	0	
✓	Plea. 4154	11.09.2011	0	
✓	Plea. 4134	11.09.2011	0	
✓	Plea. CONT.	11.09.2011	0	

Carrier	Array	No. Sample

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Final Results Print-off

Example: AM I Plus (EV3775)

Absolute Concentrations

Date: 05/29/2012 11:56:27
User Name: peter
Machine Details: EI-11169
Array Details: Antimicrobial Array I Plus
Batch Details: 4174
Date of Sample(s): 11/08/2011 16:25:49
Date of Calibration: 11/08/2011 04:14 PM
Calibrator Lot No: 4174

Sample Code	(DF)	ng/ml SZ	ng/ml SDM	ng/ml SQ	ng/ml SMT	ng/ml ST	ng/ml SS	ng/ml SP
4153	20	1.81	5.01	1.79	0.65	3.02	3.64	6.75
Sample Code	(DF)	ng/ml SM	ng/ml SMP	ng/ml SCP	ng/ml SMZ	ng/ml SD	ng/ml SMX	ng/ml SMM
4153	20	1.91	2.78	3.37	3.52	1.59	24.82	2.02
Sample Code	(DF)	ng/ml TMP	Incurred honey sample for Sulphamethoxazole & Trimethoprim					
4153	20	17.59						



Honey

- Antimicrobial Array I Ultra
- Antimicrobial Array II
- Antimicrobial Array III
- Antimicrobial Array III CAP Only
- Antimicrobial Array IV
- Antimicrobial Array V

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Antimicrobial Array I Ultra (EV3843)

Assay	Compound	Specificity (%CR)	LOD (ppb)
Sulphamerazine	Sulphamerazine	100	Honey 5.0 Milk 0.5 Tissue 2.0
	Sulphisoxazole	100	Honey 5.0 Milk 0.5 Tissue 2.0
Sulphathiazole	Sulphathiazole	100	Honey 5.0 Milk 0.5 Tissue 2.0
	Sulphadiazine	6.2	
Sulphamethazine	Sulphamethazine	100	Honey 5.0 Milk 2.5 Tissue 3.2
Sulphaquinoxaline	Sulphaquinoxaline	100	Honey 5.0 Milk 0.5 Tissue 2.0
Sulphapyridine	Sulphapyridine	100	Honey 8.0 Milk 0.5 Tissue 3.2
	Sulphasalazine	12.9	
Trimethoprim	Trimethoprim	100	Honey 9.0 Milk 0.5 Tissue 3.0
Dapsone	Dapsone	100	Honey 3.5 Milk 0.5 Tissue 3.5

Sample preparation

1. Weigh out 1g of honey sample
2. Add 19ml of working strength wash buffer (provided)
3. Place on a roller for 10 minutes or until dissolved
4. The sample is now ready for application to the biochip

* same sample preparation can be used for AMI & AMII



Antimicrobial Array II (EV3524A/B)

Assay	Compound	Specificity	LOD*
Quinolones	Norfloxacin	100	3.0
	Pefloxacin	84	
	Enrofloxacin	76	
	Ciprofloxacin	59	
	Ofloxacin	57	
	Enoxacin	54	
	Pipemidic Acid	36	
	Fleroxacin	32	
	Levofloxacin	32	
	Nalidixic Acid	27	
	Cinoxacin	23	
	Danofloxacin	20	
	Merfloxacin	16	
	Oxalic Acid	12	
	Difloxacin	8	
	Pazufloxacin	7	
	Sarafloxacin	6	
	Cefixime	Cefixime	
Diafurcefexime		92	
Thiamphenicol	Flurphenicol	100	1.0
	Thiamphenicol	53	
Streptomycin	Streptomycin	100	5.0
	Dihydrostreptomycin	182	
Tylosin	Tylosin	100	1.0
	Tilmicosin	37	
Tetracyclines	Tetracycline	100	5.0
	4-epitetraacycline	87	
	Rolitetraacycline	67	
	4-epioxytetraacycline	52	
	Oxytetraacycline	52	
	Chlortetraacycline	51	
	Demeclocycline	41	
	Doxycycline	23	
	4-epichlortetraacycline	20	
Flotetraacycline	20		

*Limit of Detection (PPB)

Sample preparation

1. Weigh out 1g of honey sample
2. Add 19ml of working strength wash buffer (provided)
3. Place on a roller for 10 minutes or until dissolved
4. The sample is now ready for application to the biochip

* same sample preparation can be used for AMI & AMII



Antimicrobial Array III (EV3695)

Assay	Compound	Specificity	LOD*
AOZ	4-NP-AOZ	100	0.3
	Furazolidone	8.3	
AMOZ	4-NP-AMOZ	100	0.08
	Furaltadone	41	
AHD	4-NP-AHD	100	0.3
	Nitrofurantoin	42	
SEM	4-NP-SEM	100	0.5
	Nitrofurazone	14	

Sample preparation

1. To 1g honey add 4mls of double deionised water (37°C), 100µl of 10mM 4-Nitrobenzaldehyde (provided in kit) and 0.5ml 1M HCL.
2. Vortex and Incubate for 2 hours at 50°C
3. Add 5ml 0.1M K₂HPO₄, 0.4ml 1M NaOH and 6mls Ethyl Acetate
4. Vortex and Centrifuge for 10 minutes
5. Remove 3mls UPPER Ethyl Acetate layer and dry down at 60°C
6. Re-suspend sample in 1ml of Hexane and 1ml of diluted wash buffer
7. Centrifuge for 10 minutes and use 50µl of LOWER layer for biochip assay



Antimicrobial Array III CAP only (EV3738)

Assay	Compound	Specificity	LOD*
Chloramphenicol	Chloramphenicol	100	0.14
	Chloramphenicol Glucuronide	75.1	

Sample preparation

1. To 1g of honey sample add 4ml of double deionised water (37°C), roll until dissolved
2. Add 15ml Ethyl Acetate to honey sample, vortex, roll and centrifuge for 10 mins
3. Remove 6ml of upper layer and dry sample on evaporator at 60°C
4. Re-suspend sample in 400µl of sample diluent and vortex
5. The sample is now ready for immediate application to the biochip.



Antimicrobial Array IV (EV3878)

Assay	Compound	Specificity	LOD*
Spiramycin/Josamycin	Spiramycin	100	2.0
	Klaxamycin	169	
	Spiramycin I	79	
	Acetylsiramycin	32	
	Josamycin	27	
Apramycin	Apramycin	100	2.0
Bactracin	Bactracin	100	1.2
Neomycin	Neomycin	100	1.0
	Paramomycin	182	
Tobramycin	Tobramycin	100	4.0
	Kanamycin B	24	
Tylosin B/Tilmicosin	Tylosin B	100	1.0
	Tylosin A	105	
	Tilmicosin	82	
	Tylvalosin	48	
Spectinomycin	Spectinomycin	100	2.6
Amikacin	Amikacin	100	6.0
	Kanamycin A	260	
	Kanamycin B	9	
Lincosamides	Lincomycin	100	8.0
	Clindamycin	160	
	Pirlmycin	38	
Erythromycin	Erythromycin	100	2.5
	Clarithromycin	498	
	Roxithromycin	334	
	Gamithromycin	51	
Streptomycin	Streptomycin	100	4.0
	Dihydrostreptomycin	135	
Virginiamycin	Virginiamycin M1	100	2.0

Sample preparation

1. Add 9ml of 50mM K₂HPO₄ (pH8.0) buffer (+37°C) to a 1g honey sample
2. Add 10ml diluted wash buffer
3. Vortex for 30 seconds or until dissolved
4. The sample is now ready for application to the biochip

Antimicrobial Array V (EV4027)

Assay	Compound	Specificity	LOD*
Nitroimidazoles	Metronidazole	100	0.9
	Ronidazole	310	
	Hydroxy-Metronidazole	145	
	Dimetridazole	90	
	Ternidazole	85	
	Ipronidazole	82	
	HMMMNI	56	
Chloramphenicol	Chloramphenicol	100	0.1
	Chloramphenicol Glucuronide	75	



Quality Testing – RX Misano



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RX Misano

- Most modern touch screen enzymatic analysis technology in the honey industry
- Now available for analysis of diastase and total sugars
- Ability to upload new parameters and export results via USB
- Superior detection system
- Highly accurate (acceptance criteria assays +/- 10% deviation)
- Excellent thermal performance –
 - Heats to 37°C <30sec
 - Cools from 37°C to 25°C < 1min
 - Lifetime of components greatly increased due to design

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Glucose/ Fructose in Honey

- Cat No. GF2635
- Simple Sample Preparation: Dissolve 1g of liquid honey in small amount of dH₂O, transfer into a 100mL volumetric flask. Dilute to the mark and mix

Diastase in Honey

- Available in packs of 50 or 500 tablets (50 tablets = 25 tests)
- Assay procedure requires 5 mL, therefore, number of tests per kit does not change between analysers
- Honey Performance data currently with R&D team

Other Possible Tests for Honey in RX Misano

- HMF
Indicator of honey freshness and overheating
- Honey colour
Optional addition of 560nm wavelength



What's included in the RX Misano package

1. RX Misano analyser
2. Misano service kit
3. Misano incubator (10 samples)
4. Pipettes, pipette tips & cuvettes
5. Full training and installation on site
6. High quality procedural booklet
7. One free kit for training purposes
8. Open channelled system

Summary

- ✓ Semi-automated bench-top system
- ✓ Based on ELISA technology (multiplexed)
- ✓ Allows simultaneous multi analyte assessment from a single honey sample
- ✓ Supplied as the complete package
- ✓ Wide test menu
- ✓ Simple sample preparation and easy to use
- ✓ Consolidated testing over Five Arrays
Providing a Full Antibiotic Profile
- ✓ Unrivalled dedication to validating arrays for a number of different floral types



Summary

Competitive sensitivity & faster analysis time in comparison to LC/MS-MS and existing screening methods

Cheaper pricing in comparison to Intertek/ QSI
Save half on confirmation costs

Easier sample prep compared to CHARM II and LC/MS-MS methods

Dedicated customer focus to all customers
Helping customers to validate their methods with on site support



Antibiotic Honey Screening
The *natural* choice for all your testing needs

Any Questions?

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