



CERTIFICATION

AOAC[®] Performance TestedSM

Certificate No.

061101

The AOAC Research Institute hereby certifies that the performance of the test kit known as:

Microgen GNA ID

manufactured by

Microgen Bioproducts Ltd.

Unit 1 Watchmoor Point

Camberley, Surrey GU15 3AD

United Kingdom

This method has been evaluated in the AOAC[®] *Performance Tested MethodsSM* Program, and found to perform as stated by the manufacturer contingent to the comments contained in the manuscript. This certificate means that an AOAC[®] Certification Mark License Agreement has been executed which authorizes the manufacturer to display the AOAC *Performance TestedSM* certification mark along with the statement - "THIS METHOD'S PERFORMANCE WAS REVIEWED BY AOAC RESEARCH INSTITUTE AND WAS FOUND TO PERFORM TO THE MANUFACTURER'S SPECIFICATIONS" - on the above mentioned method for a period of one calendar year from the date of this certificate (October 25, 2018 – December 31, 2019). Renewal may be granted at the end of one year under the rules stated in the licensing agreement.

Scott Coates

Scott Coates, Senior Director
Signature for AOAC Research Institute

October 25, 2018

Date

METHOD AUTHORS

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MODIFICATION FEBRUARY 2018: Microgen Bioproducts Ltd.

SUBMITTING COMPANY

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 1 Admiralty Way
 Camberley, Surrey GU15 3DT
 United Kingdom

CURRENT LOCATION

Microgen Bioproducts Limited
 Unit 1 Watchmoor Point
 Camberley, Surrey GU15 3AD
 United Kingdom

KIT NAME(S)

Microgen GNA ID

CATALOG NUMBERS

MID-64CE

INDEPENDENT LABORATORY

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 South Holland, IL 60473
 USA

AOAC EXPERTS AND PEER REVIEWERS

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APPLICABILITY OF METHOD

Target organism – *Salmonella* and *E. coli*
Matrices – Pure culture
Performance claims - The Microgen GNA ID product has been validated to:
Identify individual isolates of the target food related bacterial species from
a single colony on a selective agar plate
Produce a correct identification within 18-24 hours

REFERENCE METHOD

On Line *Bacteriological Analytical Manual* - www.FDA/CFSAN Bacteriological Analytical Manual Online (5)

ORIGINAL CERTIFICATION DATE

June 13, 2011

CERTIFICATION RENEWAL RECORD

Renewed Annually through December 2019

METHOD MODIFICATION RECORD

- February 2018 Level 2

SUMMARY OF MODIFICATION

- Location change from 1 Admiralty Way, Camberley to Unit 1, Watchmoor Point, Camberley.

Under this AOAC® *Performance Tested*SM License Number, 061101 this method is distributed by:

NONE

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NONE

PRINCIPLE OF THE METHOD (1)

Salmonella species and some serotypes of *E.coli* are two of the major food-borne pathogens isolated routinely by food testing laboratories and members of the family Enterobacteriaceae. In addition, *E.coli* is considered to be a highly specific indicator of potential contamination with pathogens of fecal origin. The product under test Microgen GNA ID (MID 64) has been designed to enable laboratories to correctly identify these species when sampled from a single colony isolated on a selective agar plate and differentiate them from other closely related species of the family Enterobacteriaceae. The product utilizes the ability of each of these species to metabolize specific chemical substrates. The pattern of substrate metabolism produced in the MID 64 multi-well strip is characteristic for each member of the genus *Salmonella* and each individual isolate of the species *E. coli*. The results from the multiwell strips are converted into four digit codes which are analyzed using a dedicated computer software program. This program calculates the probability that the isolate being tested is one of the target species. In addition, the software provides a comment as to the level of confidence in the proposed identification e.g. Excellent, Good or Poor Identification (14). Full descriptions of the basis and significance of these comments are found in the On-line help file provided with the software. The most probable species is identified and this is taken as the result. If a non-target species colony is introduced into the test system the pattern of results achieved will be analyzed by the dedicated software which will confirm that the isolate under test is a representative of a non-target species or genus. The substrates used in the MID 64 product are taken directly from classical literature³ and include those recommended in the current USDA/ FSIS BAM⁵ method.

DISCUSSION OF THE VALIDATION STUDY (1)

The results presented clearly indicate that the Microgen GNA ID Identification kit from Microgen Bioproducts is extremely effective for the identification of all target species, *E. coli* and *Salmonella* spp. The ability to identify isolates of these species was successfully demonstrated from a range of classical selective isolation media and the newer chromogenic agars employed routinely for the isolation of these species.

The inclusion of substrate 4, Glucose is effective at highlighting the attempted identification of non – target oxidase positive species. The combination of the inclusion of this key substrate, the warning message which appears in the Microgen ID Software whenever an isolate is negative for glucose, and the potentially extremely low probabilities ascribed to non-target *species* isolates ensures that the operator is left in no doubt whether the isolate under test is a true target *species* or not (exclusivity study).

In addition, the inclusion of the specific Additional Comment:

Salmonella cannot be fully identified using biochemistry alone. Perform Polyvalent 'O' and 'H' slide agglutination to confirm, and serotype” which appears every time the Microgen ID Software returns an identification choice of “Salmonella” appears as one or more of the identification choices provides additional confirmation of the presence of *Salmonella* spp.. In addition, the inclusion of this comment ensures that in the event that a non-target isolate returns an identification of *Salmonella* spp. it can be excluded on the basis of standard *Salmonella* serology (Polyvalent “O” and “H” slide agglutination tests).

The substrates incorporated into the Microgen GNA ID identification system are clearly able to provide accurate identification of all target species even when aberrant biochemical reactions are achieved.

The reproducibility of the Microgen GNA ID test system was evaluated using three different batches and testing performed by three separate operators produced identical results (Batch-to-Batch study).

The Microgen GNA ID product has been ascribed a shelf-life of 18 months from date of manufacture and this was confirmed by comparing the results achieved using three batches of kits tested initially in accelerated stability studies followed by real-time stability studies though to 24 months (six months beyond current shelf-life. Apart from a shift in initial colour produced in the Glucose and Xylose substrate wells (wells 4 & 6 respectively) which tend to become green rather than blue on reconstitution (green is still considered a negative result) the rest of the substrates were clearly very stable over the 18 month period storage at 4°C.

The range of tests performed to examine the robustness of the identification system demonstrated both the physical robustness of the system in terms of extremes in storage conditions and variation in manufacturing and user application. All trials undertaken returned a 100% correlation with control tests (ruggedness study).

The MID 64 GNA ID Identification kit has shown itself through these trials to be both extremely accurate and robust.

Table 6: Inclusivity Isolates Tested – Salmonella (1)
(unless indicated, strains are wild strains isolated from indicated sources)

Number	MBC	Bacterial species	ATCC	NCTC/NCIMB	GNA Result	Identification/Probability	Source	Serogroup	Subspecies	Comments
1	141	<i>Salmonella</i> Hadar		NCIMB 13033	7702	<i>Salmonella</i> spp. (1/1)	Chicken Giblets	C2	enterica	
2	146	<i>Salmonella</i> Infantis		NCIMB 13036	7702	<i>Salmonella</i> spp. (1/1)	Chicken Meat	C1	enterica	
3	215	<i>Salmonella</i> Typhimurium	14028		7602	<i>Salmonella</i> spp. (1/41)	Chicken isolate	B	enterica	
4	331	<i>Salmonella</i> Berkeley		NCTC 8260	7702	<i>Salmonella</i> spp. (1/1)	Diseased Turkey	U	enterica	
5	345	<i>Salmonella</i> Cubana		NCTC 7101	7702	<i>Salmonella</i> spp. (1/1)	Chicken, Diarrhoea	G	enterica	
6	818	<i>Salmonella</i> arizonae		NCTC 7355	7742	<i>Salmonella</i> arizonae (1/1)	Viscera of gopher snake			
7	1284	<i>Salmonella</i> Ohio			7702	<i>Salmonella</i> spp. (1/1)	Raw Poultry	C1	enterica	
8	1285	<i>Salmonella</i> Kentucky			7702	<i>Salmonella</i> spp. (1/1)	Environmental swab	C3	enterica	
9	1286	<i>Salmonella</i> Kentucky			7702	<i>Salmonella</i> spp. (1/1)	Lizard faeces	C3	enterica	
10	1287	<i>Salmonella</i> Othmarschen			7702	<i>Salmonella</i> spp. (1/1)	Spice	C1	enterica	
11	1288	<i>Salmonella</i> Weltevreden			7702	<i>Salmonella</i> spp. (1/1)	Dried mushroom	E1	enterica	
12	1289	<i>Salmonella</i> Kottbus			7702	<i>Salmonella</i> spp. (1/1)	Duck's liver	C2	enterica	
13	1290	<i>Salmonella</i> Tranoroa			7742	<i>Salmonella</i> arizonae (1/1)	Gecko	55	salamae	
14	1291	<i>Salmonella</i> Orion var 15+			7702	<i>Salmonella</i> spp. (1/1)	Sesame seeds	E1	enterica	
15	1292	<i>Salmonella</i> Paratyphi B var Java			7702	<i>Salmonella</i> spp. (1/1)	Betel nuts	B	enterica	
16	1293	<i>Salmonella</i> Sinstorf			7702	<i>Salmonella</i> spp. (1/1)	Melon seeds (ground eguis)	E1	enterica	
17	1294	<i>Salmonella</i> Kentucky			7702	<i>Salmonella</i> spp. (1/1)	bark bedding from reptile	C3	enterica	
18	1295	<i>Salmonella</i> Kentucky			7702	<i>Salmonella</i> spp. (1/1)	cleaning cloth	C3	enterica	
19	1296	<i>Salmonella</i> Enteritidis			7702	<i>Salmonella</i> spp. (1/1)	chocolate swiss roll	D1	enterica	
20	1297	<i>Salmonella</i> Infantis			6702	<i>Salmonella</i> cholera-suis (1/9)	Pasta	C1	enterica	
21	1298	<i>Salmonella</i> Anatum			7602	<i>Salmonella</i> spp. (1/41)	Pork liver	E1	enterica	
22	1299	<i>Salmonella</i> Pullorum			6602	<i>Salmonella</i> cholera-suis (1/433)	Egg	D1	enterica	
23	1300	<i>Salmonella</i> Abaetetuba			7702	<i>Salmonella</i> spp. (1/1)	Creek water	F	enterica	
24	346	<i>Salmonella</i> Sandiego		NCTC 5719	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	B	enterica	
25	347	<i>Salmonella</i> Banalia		NCTC 8242	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	C2	enterica	
26	348	<i>Salmonella</i> Waycross		NCTC 7401	7702	<i>Salmonella</i> spp. (1/1)	Edwards, Kentucky	Serogroup	enterica	
27	403	<i>Salmonella</i> Tranoroa		NCTC 10252	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	55	salamae	
28	1121	<i>Salmonella</i> arizonae	13314	NCTC 8297	7742	<i>Salmonella</i> arizonae (1/1)	Type Strain			
29	329	<i>Salmonella</i> Bispebjerg		NCTC 8486	7702	<i>Salmonella</i> spp. (1/1)	CPHL, <i>Salmonella</i> ref.	B	enterica	
30	330	<i>Salmonella</i> Java		NCTC 5706	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	B	enterica	
31	332	<i>Salmonella</i> Birkenhead		NCTC 7744	7702	<i>Salmonella</i> spp. (1/1)	CPHL, <i>Salmonella</i> ref.	C1	enterica	
32	333	<i>Salmonella</i> Virginia		NCTC 6947	7702	<i>Salmonella</i> spp. (1/1)	Clinical, gastro-enteritis	C3	enterica	

Table 6: Inclusivity Isolates Tested – Salmonella Cont'd..... (1)
(unless indicated, strains are wild strains isolated from indicated sources)

Number	MBCC	Bacterial species	ATCC	NCTC/NCIMB	GNA Result	Identification/Probability	Source	Serogroup	Subspecies	Comments
33	334	<i>Salmonella</i> Saintpaul		NCTC 6022	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	B	enterica	
34	335	<i>Salmonella</i> Rubislaw		NCTC 8497	6702	<i>Salmonella</i> cholera-suis (1/9)	Edwards, Chamblee	F	enterica	
35	336	<i>Salmonella</i> Rostock		NCTC 5767	6702	<i>Salmonella</i> cholera-suis (1/9)	Serum inst. Copenhagen	D1	enterica	
36	337	<i>Salmonella</i> Moscow		NCTC 10480	6702	<i>Salmonella</i> cholera-suis (1/9)	CPHL, <i>Salmonella</i> ref.	D1	enterica	
37	338	<i>Salmonella</i> Montevideo		NCTC 5747	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	C1	enterica	
38	339	<i>Salmonella</i> Oranienberg		NCTC 5743	6702	<i>Salmonella</i> cholera-suis (1/9)	Serum inst. Copenhagen	C1	enterica	
39	340	<i>Salmonella</i> London		NCTC 5777	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	E1	enterica	
40	341	<i>Salmonella</i> Meleagridis		NCTC 6023	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	E1	enterica	
41	342	<i>Salmonella</i> Telaviv		NCTC 6020	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	M	enterica	
42	343	<i>Salmonella</i> Give		NCTC 5778	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	E1	enterica	
43	344	<i>Salmonella</i> Blukwa		NCTC 8271	7702	<i>Salmonella</i> spp. (1/1)	Serum inst. Copenhagen	K	enterica	
44	115	<i>Salmonella</i> Albany			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group C, H7	enterica	Group C3
45	116	<i>Salmonella</i> Allandale			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group R, G10	enterica	Group R
46	118	<i>Salmonella</i> Assinie			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group E, H9	enterica	Group E1
47	119	<i>Salmonella</i> Bergen			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group X, I2	enterica	Group X
48	121	<i>Salmonella</i> Bolombo			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group E1, I1	enterica	Group E1
49	122	<i>Salmonella</i> California			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group B, G7	enterica	Group B
50	123	<i>Salmonella</i> Coeln			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group B, G6	enterica	Group B
51	125	<i>Salmonella</i> Derby			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group B, H8	enterica	Group B
52	127	<i>Salmonella</i> Dublin			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group D1, X7	enterica	Group D1
53	138	<i>Salmonella</i> Gaminara			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group I, H4	enterica	Group I
54	144	<i>Salmonella</i> Hvittingfoss			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group B1, Y9	enterica	Group I
55	157	<i>Salmonella</i> Senftenburg			7702	<i>Salmonella</i> spp. (1/1)	Lab M	Group E1, G2	enterica	Group E4
56	159	<i>Salmonella</i> Tennessee			6702	<i>Salmonella</i> cholera-suis (1/9)	Lab M	Group C1, F9	enterica	Group C1

Note: In each case where *Salmonella* spp. was not the first choice it was the second choice (see below)

GNA Result	First Choice	Second Choice
6702	<i>Salmonella</i> Cholera-suis (1/9)	<i>Salmonella</i> spp. (1/24)
6602	<i>Salmonella</i> Cholera-suis (1/433)	<i>Salmonella</i> spp. (1/772)

Table 7: Inclusivity Isolates Tested – E. coli (1)

(unless indicated, strains are wild strains isolated from indicated sources)

Number	MBCC	Bacterial species	ATCC	NCTC/NCIMB	GNA Result	Identification/Probability	Source	Serotype
1	70	<i>E. coli</i>	10536	NCTC 10418	6760	<i>E. coli</i> (1/2)		
2	71	<i>E. coli</i>		NCTC 13148	6760	<i>E. coli</i> (1/2)		
3	72	<i>E. coli</i>		NCTC 9111	6760	<i>E. coli</i> (1/2)	Serum inst. Copenhagen	Serotype 0111
4	206	<i>E. coli</i>		NCTC 12900	6760	<i>E. coli</i> (1/2)		Serotype 0157 (non-VETC)
5	217	<i>E. coli</i>	25922		6760	<i>E. coli</i> (1/2)	TCS, Clinical Isolate	
6	632	<i>E. coli</i>		NCTC 9001	6760	<i>E. coli</i> (1/2)	Human Urine	
7	636	<i>E. coli</i>		NCTC 9103	6760	<i>E. coli</i> (1/2)	Serum Inst. Copenhagen	
8	637	<i>E. coli</i>		NCTC 10279	4760	<i>E. coli</i> (1/4)	CPHL, reference culture	
9	643	<i>E. coli</i>		NCTC 8960	6760	<i>E. coli</i> (1/2)	Serum inst. Copenhagen	Serotype 026
10	1239	<i>E. coli</i>		NCTC 13352	4760	<i>E. coli</i> (1/4)	ESBL Strain	
11	1240	<i>E. coli</i>		NCTC 13353	6760	<i>E. coli</i> (1/2)	ESBL Strain	
12	67	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	LabM (wild strain)	
13	68	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	Lab M (wild Strain)	
14	69	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	Lab M (wild Strain)	
15	87	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	MAFF Isolate	Serotype 0157
16	88	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	MAFF Isolate	Serotype 0157
17	89	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	MAFF Isolate	Serotype 0157
18	90	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	MAFF Isolate	Serotype 0157
19	418	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	Commercial Food Testing Lab.	Serotype 0157:H7
20	519	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	VLA, Veterinary Isolate	
21	520	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	VLA, Veterinary Isolate	
22	630	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	Lab M (wild Strain)	
23	633	<i>E. coli</i>			0760	<i>E. coli</i> -inactive (1/9)	Aberdeen, Veterinary isolate	Serotype 0111
24	635	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	Aberdeen, Veterinary isolate	Serotype 0111
25	638	<i>E. coli</i>			6760	<i>E. coli</i> (1.2)	Aberdeen, Veterinary isolate	Serotype 026
26	640	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	Lab M (wild Strain)	Serotype 0157
27	641	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	Lab M (wild Strain)	Serotype 0157
28	642	<i>E. coli</i>			6720	<i>E. coli</i> (1/39)	Lab M (wild Strain)	Serotype 0157
29	644	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	Lab M (wild Strain)	Serotype 0157
30	645	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	Lab M (wild Strain)	Serotype 0157
31	646	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	Lab M (wild Strain)	Serotype 0157
32	647	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	Lab M (wild Strain)	Serotype 0157
33	648	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	Lab M (wild Strain)	Serotype 0157
34	48	<i>E. coli</i>			0760	<i>E. coli</i> -inactive (1/9)	Lab M, Clinical Isolate	
35	167	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	MEDVET, Australia	
36	639	<i>E. coli</i>			4760	<i>E. coli</i> (1/4)	CPHL, reference culture	
37	586	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	West Park Hospital, Clinical Isolate	
38	588	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	West Park Hospital, Clinical Isolate	
39	589	<i>E. coli</i>			0760	<i>E. coli</i> -inactive (1/9)	West Park Hospital, Clinical Isolate	
40	590	<i>E. coli</i>			6760	<i>E. coli</i> (1/2)	West Park Hospital, Clinical Isolate	

Table 8: Exclusivity Isolates Tested (included in the Microgen GNA ID Database) (1)

Sample	MBCC no.	ATCC No	Organism	Source Laboratory	Microgen GNA ID Software result	API 20E Software result	Isolated From (or other comments):
1	164		<i>Acinetobacter baumani</i>	Medvet, Australia	<i>A. baumannii</i> (1/3) (very good)	<i>A. baumannii</i> (good)	
2	208	19606	<i>Acinetobacter baumani</i>	TCS	<i>A. baumannii</i> (1/3) (very good)	<i>A. baumannii</i> (very good)	ATCC Type Strain
3	38		<i>Acinetobacter sp.</i>	LabM	<i>A. baumannii</i> (1/3) (very good)	<i>A. baum/calco</i> (good)	
4	60		<i>C. freundii</i>	LabM	<i>C. freundii</i> (1/7) (excellent)	<i>C. freundii</i> (very good)	
5	61		<i>C. freundii</i>	LabM	<i>C. freundii</i> (1/6) (excellent)	<i>C. youngae</i> (very good)	
6	62		<i>C. freundii</i>	LabM	<i>C. freundii</i> (1/45) (acceptable)	<i>C. youngae</i> (very good)	
7	63		<i>C. freundii</i>	LabM	<i>C. freundii</i> (1/7) (excellent)	<i>C. freundii</i> (excellent)	
8	64	0890	<i>C. freundii</i>	LabM (NCTC 9750)	<i>C. freundii</i> (1/7) (excellent)	<i>C. freundii</i> (very good)	ATCC Type Strain
9	65		<i>C. diversus</i>	LabM	<i>C. diversus</i> (1/1) (excellent)	No identification	
10	631		<i>E. hermannii</i>	LabM	<i>E.coli</i> (1/2) (excellent)	<i>E. coli</i> (low)	Supplied as <i>E. hermannii</i>
11	49		<i>Enterobacter cloacae</i>	LabM	<i>E. cloacae</i> (1/2) (very good)	<i>E. cloacae</i> (good)	
12	50		<i>Enterobacter cloacae</i>	LabM	<i>E. cloacae</i> (1/2) (very good)	<i>E. cloacae</i> (good)	
13	51		<i>Enterobacter cloacae</i>	LabM	<i>E. cloacae</i> (1/163) (inconclusive*)	<i>E. cloacae</i> (good)	
14	162		<i>Enterobacter cloacae</i>	Medvet, Australia	<i>E. cloacae</i> (1/2) (very good)	<i>E. cloacae</i> (good)	
15	53		<i>Enterobacter aerogenes</i>	LabM	<i>E. aerogenes</i> (1/1) (acceptable)	<i>E. aerogenes</i> (good)	
16	209	13048	<i>Enterobacter aerogenes</i>	TCS (NCTC 10006)	<i>E. aerogenes</i> (1/1) (acceptable)	<i>Serratia fonticola</i> (poor)	ATCC Type Strain
17	45		<i>K. oxytoca</i>	LabM	<i>K oxytoca</i> (1/1) (excellent)	<i>K oxytoca</i> (poor)	
18	46		<i>K oxytoca</i>	LabM	<i>K oxytoca</i> (1/1) (excellent)	<i>K oxytoca</i> (good)	
19	47		<i>K. pneumoniae</i>	LabM	<i>K. pneumoniae</i> (1/1) (excellent)	<i>K. pneumoniae</i> (good)	
20	161		<i>K. pneumoniae</i>	Medvet, Australia	<i>K. pneumoniae</i> (1/1) (excellent)	<i>K. pneumoniae</i> (good)	
21	211		<i>K. pneumoniae</i>	TCS (NCTC 9528)	<i>K. pneumoniae</i> (1/1) (excellent)	<i>K. pneumoniae</i> (good)	Butter
22	77	29906	<i>P. mirabilis</i>	LabM	<i>P. mirabilis</i> (1/3) (excellent)	<i>P. mirabilis</i> (excellent)	ATCC Type Strain
23	78		<i>P. mirabilis</i>	LabM	<i>P. mirabilis</i> (1/3) (excellent)	<i>P. mirabilis</i> (excellent)	
24	166		<i>P. mirabilis</i>	Medvet, Australia	<i>P. mirabilis</i> (1/169) (acceptable)	<i>P. mirabilis</i> (very good)	
25	212	14153	<i>P. mirabilis</i>	TCS (NCTC 13376)	<i>P. mirabilis</i> (1/169) (acceptable)	<i>M. morganni</i> (good)	ATCC Type Strain
26	168		<i>P. stuartii</i>	Medvet, Australia	<i>P. stuartii</i> (1/6) (good)	<i>P. stuartii</i> (good)	
27	627		<i>Providencia sp.</i>	West Park Hospital	<i>P. stuartii</i> (1/6) (good)	<i>P. stuartii</i> (good)	
Sample	MBCC no.	ATCC No	Organism	Source Laboratory	Microgen GNA ID Software result	API 20E Software result	Isolated From (or other comments):
28	57		<i>S. marcescens</i>	LabM	<i>S. marcescens</i> (1/1) (excellent)	<i>S. marcescens</i> (very good)	
29	58		<i>S. marcescens</i>	LabM	<i>S. marcescens</i> (1/1) (excellent)	<i>S. marcescens</i> (excellent)	
30	59	274	<i>S. marcescens</i>	LabM (NCTC 1377)	<i>S. marcescens</i> (1/1) (excellent)	<i>S. marcescens</i> (very good)	ATCC Type Strain

31	163		<i>S. marcescens</i>	Medvet, Australia	<i>S. marcescens</i> (1/1) (excellent)	<i>S. marcescens</i> (excellent)	
32	1		<i>S. flexneri</i>	LabM	<i>Shigella</i> subgroup A,B,C (1/2) (very good)	No identification	
33	42		<i>S. flexneri</i>	LabM	<i>Shigella</i> subgroup A,B,C (1/2) (very good)	<i>Shigella</i> species (poor)	
34	43		<i>S. flexneri</i>	LabM	<i>Shigella</i> subgroup A,B,C (1/2) (very good)	<i>Shigella</i> species (good)	
35	39		<i>S. sonnei</i>	LabM	<i>Sh. sonnei</i> (1/1) (excellent)	<i>Sh. sonnei</i> (very good)	
36	40		<i>S. sonnei</i>	LabM	<i>Sh. sonnei</i> (1/1) (excellent)	<i>Sh. sonnei</i> (very good)	
37	214	25931	<i>S. sonnei</i>	TCS	<i>Sh. sonnei</i> (1/1) (excellent)	<i>Sh. sonnei</i> (very good)	ATCC Type Strain
38	506		<i>Y. enterocolitica</i>	VLA	<i>Y. enterocolitica</i> (1/10) (good)	<i>Y. enterocolitica</i> (good)	
39	507		<i>Y. enterocolitica</i>	VLA	<i>Y. enterocolitica</i> (1/10) (acceptable)	<i>Y. enterocolitica</i> (very good)	
40	515		<i>Y. enterocolitica</i>	VLA	<i>Y. enterocolitica</i> (1/4) (excellent)	<i>Y. enterocolitica</i> (very good)	

Table 9: Exclusivity Isolates Tested (not included in the Microgen GNA ID Database) (1)

Sample	MBCC no.	ATCC No	Organism	Source Laboratory	Microgen GNA ID Software result	Isolated From (or other comments)	Notes
1	61		<i>Citrobacter youngae</i>	Lab M	<i>C. freundii</i> (1/6) (Excellent)		
2	80		<i>Pseudomonas. aeruginosa</i>	Lab M	<i>A. baumannii</i> (1/31) (Acceptable)	NCTC 10662	
3	81	27853	<i>Pseudomonas aeruginosa</i>	Lab M	<i>A. baumannii</i> (1/21) (Acceptable)		
4	170	7966	<i>Aeromonas hydrophila</i>	Microbiologics	<i>C. freundii</i> (1/323,721) (Unacceptable)		
5	195		<i>Staphylococcus aureus</i>	NCTC	<i>P. agglomerans</i> (1/801) (Doubtful)	NCTC 8532	
6	207	6633	<i>Bacillus subtilis</i>	TCS	<i>P. agglomerans</i> (1/89) (Acceptable)		
7	516		<i>Yersinia frederiksenii</i>	VLA	<i>Y. enterolitica</i> (1/163) (Acceptable)		
8	517		<i>Yersinia ruckeri</i>	VLA	<i>S. ParaTyphi A</i> (1/1) (Very Good)		1
9	679		<i>Burkholderia cepacia</i>	Southampton HPA	<i>K. ozaenae</i> (1/2,161) (Doubtful)		
10	690		<i>Stenotrophomonas maltophilia</i>	Southampton HPA	<i>A. lwoffii</i> (1/3) (Acceptable)		2
11	810		<i>Bacillus cereus</i>	NCTC	<i>S. marcescens</i> (1/8,196) (Acceptable)	NCTC 10320	
12	1025		<i>Enterococcus faecalis</i>	NCTC	<i>P. agglomerans</i> (1/801) (Doubtful)	NCTC 12204	
13	1204		<i>Burkholderia stabilis</i>	University Edinburgh	<i>S. marcescens</i> (1/7,638) (Acceptable)		
14	1205		<i>Burkholderiaceenocepacia</i>	University Edinburgh	<i>A. baumannii</i> (1/769) (Acceptable)		
15	1206		<i>Burkholderia multivorans</i>	University Edinburgh	<i>S. marcescens</i> (1/7,360.060) (Acceptable)		2
16	1208		<i>Achromobacter xylosoxidans</i>	University Edinburgh	<i>A. baumannii</i> (1/23,768) (Acceptable)		2
17	1209		<i>Burkholderia cepacia</i>	University Edinburgh	<i>A. baumannii</i> (1/66,825) (Unacceptable)		
18	1210		<i>Ralstinia mannitolytica</i>	University Edinburgh	<i>A. lwoffii</i> (1/89) (Inconclusive)		2
19	1213		<i>Pseudomonas putida</i>	University Edinburgh	<i>A. lwoffii</i> (1/89) (Inconclusive)		2
20	1214		<i>Burkholderia vietnamiensis</i>	University Edinburgh	<i>A. lwoffii</i> (1/43) (Acceptable)		
21	1215		<i>Chryseobacterium indologenes</i>	University Edinburgh	<i>K. pneumoniae</i> (1/556,329) (Unacceptable)		
22	1307	17802	<i>Vibrio parahaemolyticus</i>	Microbiologics	<i>P. rettgeri</i> (1/24,701,003) (Unacceptable)		

REFERENCES CITED

1. Mugg, P., Evaluation of the Microgen GNA ID (MID-64), AOAC® *Performance Tested*SM certification number 061101.
2. AOAC Research Institute Validation Outline for Microgen GNA ID (MID-64), Approved – June 2011.
3. Manual of Clinical Microbiology Murray P.R., Baron E.J., Jorgensen J.H., Landry M.L. and M.A. Pfaller (Eds), 9th Edition, ASM Press, 2007
4. Ewing W.H. 1986 Edwards and Ewing's Identification of Enterobacteriaceae, 4th Ed. Elsevier Science Publishing C. Inc. New York. N.Y.
5. On Line *Bacteriological Analytical Manual* - www.FDA/CFSSAN Bacteriological Analytical Manual Online