



CERTIFICATION

AOAC[®] Performance TestedSM

Certificate No.

030201

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

GeneQuenceTM Salmonella Microwell Test

manufactured by

**Neogen Corporation
620 Leshar Place
Lansing, Michigan 48912
USA**

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 (November 29, 2019 – December 31, 2020). 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

November 29, 2020

Date

METHOD AUTHORS

Gregory W. Durbin, Karen S. Gwozdowski, Charles B. Bird, and Mark A. Mozola

SUBMITTING COMPANY

Neogen Corporation
620 Leshar Place
Lansing, Michigan 48912

KIT NAME(S)

GeneQuence^{RM} *Salmonella* Microwell Test

CATALOG NUMBERS

6700, 6700B

INDEPENDENT LABORATORY

Cherney Microbiological Services, Ltd.
1110 S. Huron Rd.
Green Bay, WI 54311
USA

AOAC EXPERTS AND PEER REVIEWERS

Wallace Andrews¹, Edward Richter², Scott Coates³
¹ Retired USDA FDA CFSAN, College Park, MD, USA
² Richter International, Columbus, OH, USA
³ AOAC International

APPLICABILITY OF METHOD

Target analyte – *Salmonella* spp.

Matrices – (48 hour enrichment, 25 g) - raw whole egg, dried whole egg, nonfat dry milk, chocolate, refrigerated dough, soy flour, egg noodles, cheese powder, cake mix, walnuts, food dye, black pepper, dried fruit, frozen fruit, mushrooms, surimi, raw ground beef, raw ground pork, raw fish, raw turkey, raw chicken, beef franks, dry pet food, and peanut butter (24 hour enrichment, 25 g) – raw poultry, pasteurized egg product (dried, liquid, and frozen), milk chocolate, dry pet food

Performance claims – The method was found to be equivalent to the reference methods.

REFERENCE METHOD

U.S. Food and Drug Administration. 1998. *Bacteriological Analytical Manual*, 8th ed., Rev. A, AOAC International, Gaithersburg, MD, Chapter 5. (2)

ORIGINAL CERTIFICATION DATE

2001

CERTIFICATION RENEWAL RECORD

Renewed annually through December 2020

METHOD MODIFICATION RECORD

1. November 2018 Level 1

SUMMARY OF MODIFICATION

1. Editorial changes include: typographical corrections and updates to Spanish insert

Under this AOAC[®] *Performance Tested*SM License Number, 030201 this method is distributed by:
None

Under this AOAC[®] *Performance Tested*SM License Number, 030201 this method is distributed as:
None

PRINCIPLE OF THE METHOD (1)

The GENE-TRAK[®] *Salmonella* Microwell assay is a DNA probe based diagnostic in kit format which permits rapid and accurate detection of *Salmonella* spp. in foods. Following sample pre-enrichment, selective enrichment, and post enrichment incubation periods, target bacteria are lysed enzymatically at 65°C and *Salmonella* - specific oligonucleotide probes are added for a 60 minute hybridization incubation at 45°C. If *Salmonella* ribosomal RNA (rRNA) is present in the test sample, detector probe directly labeled with horseradish peroxidase (HRP) and polydeoxyadenylic acid (poly dA)-tailed capture probe hybridize to the target organism rRNA sequences. Concurrently, base pairing between the poly dA tailed capture probe and polydeoxythymidylic acid (poly dT) coated polystyrene microwells facilitates solid phase capture of the probe-target hybrid molecules. Unbound probe is removed by washing, and substrate chromogen is added to each well. The reaction of HRP with substrate chromogen produces a blue color. The reaction is stopped with the addition of sulfuric acid which changes the color of the substrate from blue to yellow. A microwell plate or microwell strip reader (A₄₅₀) measures absorbance: absorbance in excess of the threshold value indicates the presence of *Salmonella* spp. in the test sample. Positive assay results must be confirmed by standard culture methods.

DISCUSSION OF THE VALIDATION STUDY (1)

Results of the 20-food trial clearly show that the microwell assay, whether performed manually or by an automated instrument, is capable of detecting low levels of *Salmonella* spp. in a wide variety of foods.

False negative rates of 1% or less were observed, and further the microwell method showed very close agreement (98.8% or greater) to both the BAM/AOAC culture method and the established GENE-TRAK *Salmonella* DLP dipstick probe assay. The assay has also been proven to be very specific, with no cross reactions observed in exclusivity testing and a false positive rate of less than 3% exhibited by the manual microwell assay in testing of foods. A somewhat higher rate of unconfirmed positive reactions was observed with the automated version of the assay compared to the manual version. In both cases, there was no apparent pattern to these false positive results; they did not appear to be related to the food matrix or any inherent reactivity of the probes with particular competitor organisms. The later statement is supported by the results of exclusivity testing and also by the fact that, in all but one case (chocolate), false positive reactions occurred by only one or two of the three probe methods in any given experiment. This is relevant since the probe set used is the same for the three probe tests. It is thought that these false positive results are random; possible causes include incomplete washing of individual wells and rare splashing of sample or reagents from well to well during pipetting. This latter procedural difficulty is inherent in the design of microwell based assays in which the coated well reaction vessels are in extremely close physical proximity. This situation will be exacerbated in cases where the majority of samples tested contain the target organism, such as the case here. In routine quality control testing in which the majority of samples are negative, we expect false positive rates to be lower.

Results of the external validation study support the conclusion that the microwell assay displays a sensitivity comparable to that of the BAM/AOAC culture method when used for the detection of *Salmonella* spp. in a variety of foods. The microwell and BAM/AOAC methods produced a comparable number of positive results for each of the three food types tested as determined by χ^2 analysis. Only one apparent false positive result was obtained.

Table 1 Inclusivity Testing Results (1)

	Serovar	Strain #	Source	Assay Result (~ 10 ⁷ cfu)	
				A ₄₅₀ ^a	pos/neg
1	S. Aberdeen	2677	CDC	1.65	positive
2	S. Abortus-bovis	2322	CDC	1.79	positive ^b
3	S. Abortus-equi	2408	CDC	1.42	positive
4	S. Adelaide	3028	CDC	1.40	positive
5	S. Aesch	3180	CDC	0.84	positive
6	S. Agona	2284	CDC	1.44	positive
7	S. Alachua	3029	CDC	1.62	positive
8	S. Albany	662	U. Massachusetts	0.38	positive
9	S. Amersfoort	2375	CDC	0.72	positive
10	S. Anatum	2626	CDC	1.43	positive
11	S. Anatum	2636	CDC	1.51	positive
12	S. Anatum	2624	CDC	1.48	positive
13	S. Antarctica	3195	CDC	0.76	positive
14	S. Arizonae	799	ATCC 13314	1.66	positive
15	S. Arizonae	2652	CDC	1.41	positive
16	S. Arkansas	2643	CDC	1.75	positive
17	S. Artis	3091	CDC	1.39	positive
18	S. Babelsberg	2722	CDC	1.48	positive
19	S. Bareilly	2379	CDC	1.24	positive
20	S. Bere	3070	CDC	0.66	positive
21	S. Bergen	3071	CDC	1.67	positive
22	S. Bern	3039	CDC	0.34	positive
23	S. Berta	2884	CDC	0.63	positive
24	S. Betioky	3093	CDC	1.29	positive
25	S. Binza	619	U. Massachusetts	1.40	positive
26	S. Bispebjerg	2323	CDC	0.72	positive
27	S. Blegdam	2582	CDC	1.07	positive
28	S. Blockley	2544	CDC	1.49	positive
29	S. Blukwa	1859	CDC	1.51	positive
30	S. Bornum	2674	CDC	0.97	positive
31	S. Bovismorbificans	2545	CDC	1.28	positive
32	S. Braenderup	2378	CDC	1.25	positive
33	S. Brandenburg	2286	CDC	1.42	positive
34	S. Bredeney	2288	CDC	1.38	positive

35	S. Budapest	2324	CDC	1.42	positive
36	S. Bulawayo	3040	CDC	0.51	positive
37	S. Bunnik	3062	CDC	0.80	positive
38	S. Butantan	2637	CDC	1.65	positive
39	S. California	625	Mass. State Lab	1.52	positive
40	S. Carrau	2690	CDC	0.87	positive
41	S. Cerro	2691	CDC	1.20	positive
42	S. Champaign	3037	CDC	1.71	positive
43	S. Chester	2289	CDC	1.69	positive
44	S. Chittagong	3233	CDC	0.63	positive
45	S. Cholerasuis	2886	CDC	1.22	positive
46	S. Cook	3181	CDC	1.27	positive
47	S. Crossness	3199	CDC	0.90	positive
48	S. Dahlem	3082	CDC	1.44	positive
49	S. Dakar	2723	CDC	1.13	positive
50	S. Daressalaam	2583	CDC	0.26	positive
51	S. Derby	2990	CDC	1.31	positive
52	S. Derby	2290	CDC	1.51	positive
53	S. Deversoir	3068	CDC	0.94	positive
54	S. Djakarta	3083	CDC	1.21	positive
55	S. Djuju	663	Deibel Labs	1.43	positive
56	S. Dublin	2584	CDC	1.63	positive
57	S. Duesseldorf	2547	CDC	1.51	positive
58	S. Dugbe	3069	CDC	1.70	positive
59	S. Eastbourne	2881	CDC	1.16	positive
60	S. Eimsbuettel	2103	CDC	1.11	positive
61	S. Emmastad	3032	CDC	1.73	positive
62	S. Enteritidis	2124	ATCC 13076	1.54	positive
63	S. Essen	3254	CDC	1.66	positive
64	S. Flint	3084	CDC	0.20	positive
65	S. Florida	2711	CDC	0.99	positive
66	S. Freetown	3033	CDC	0.84	positive
67	S. Fresno	2620	CDC	1.45	positive
68	S. Gallinarum	896		1.54	positive
69	S. Gaminara	2714	CDC	1.46	positive
70	S. Gateshead	2621	CDC	1.71	positive
71	S. Give	2638	CDC	1.28	positive
72	S. Glostrup	2548	CDC	1.25	positive
73	S. Greenside	3085	CDC	1.75	positive
74	S. Guinea	3066	CDC	1.63	positive
75	S. Haardt	2549	CDC	1.23	positive
76	S. Hadar	623	Mass. State Lab	1.70	positive
77	S. Hartford	2439	CDC	1.09	positive
78	S. Havana	1858	CDC	0.77	positive
79	S. Heidelberg	2304	CDC	1.63	positive
80	S. Heidelberg	2327	CDC	1.31	positive
81	S. Hoograven	3086	CDC	1.29	positive
82	S. Horsham	2712	CDC	1.46	positive
83	S. Houten	4467	Silliker Labs	0.20	positive
84	S. Humber	3089	CDC	0.32	positive
85	S. Hvittingfoss	913	CDC	1.30	positive
86	S. Ibadan	912	CDC	1.44	positive
87	S. Illinois	2645	CDC	1.41	positive
88	S. Indiana	628	Mass. State Lab	1.27	positive
89	S. Infantis	2440	CDC	0.93	positive

90	S. Infantis	2477	CDC	1.47	positive
91	S. Iverness	3034	CDC	1.73	positive
92	S. Java	2306	CDC	1.64	positive
93	S. Javiana	2589	CDC	0.80	positive
94	S. Johannesburg	3055	CDC	1.69	positive
95	S. Kaolack	3072	CDC	1.43	positive
96	S. Karamoja	3056	CDC	0.42	positive
97	S. Kentucky	2581	CDC	1.20	positive
98	S. Kentucky	548	Mass. State Lab	1.77	positive
99	S. Kiel	657	Deibel Labs	1.28	positive
100	S. Kingabwa	3064	CDC	1.71	positive
101	S. Kinshasa	908	CDC	1.31	positive
102	S. Kirkee	2716	CDC	1.12	positive
103	S. Kottbus	2550	CDC	1.32	positive
104	S. Krefeld	2650	CDC	0.60	positive
105	S. Kuzendorf	3197	CDC	0.84	positive
106	S. Lansing	3036	CDC	1.72	positive
107	S. Lexington	2158	FDA	1.30	positive
108	S. Lindenburg	910	CDC	1.41	positive
109	S. Litchfield	2551	CDC	1.53	positive
110	S. Livingstone	2478	CDC	1.36	positive
111	S. Lomita	617	U. Massachusetts	0.34	positive
112	S. London	2640	CDC	1.71	positive
113	S. Luciana	2651	CDC	1.65	positive
114	S. Luton	3094	CDC	1.61	positive
115	S. Manhattan	630	Mass. State Lab	1.71	positive
116	S. Marshall	2679	CDC	1.04	positive
117	S. Matopeni	2725	CDC	1.48	positive
118	S. Mbandaka	2479	CDC	1.44	positive
119	S. Meleagridis	2641	CDC	1.45	positive
120	S. Milkwasima	2480	CDC	0.57	positive
121	S. Minneapolis	2646	CDC	1.20	positive
122	S. Minnesota	2721	CDC	1.69	positive
123	S. Mississippi	2685	CDC	1.59	positive
124	S. Monschauvi	3030	CDC	1.71	positive
125	S. Montevideo	2483	CDC	1.33	positive
126	S. Montevideo	2485	CDC	1.58	positive
127	S. Morehead	3021	CDC	1.02	positive
128	S. Moscow	2591	CDC	1.70	positive
129	S. Muenchen	2553	CDC	1.15	positive
130	S. Muenster	2510	Georgia USDA	1.28	positive
131	S. Muenster	2509	CDC	1.31	positive
132	S. Narashino	2556	CDC	1.30	positive
133	S. Newbrunswick	2101	CDC	1.34	positive
134	S. Newport	2557	CDC	1.70	positive
135	S. Newport var. puerto rico	2558	CDC	0.77	positive
136	S. Niarembe	3067	CDC	1.49	positive
137	S. Nottingham	2715	CDC	1.52	positive
138	S. Nyborg	2642	CDC	0.65	positive
139	S. Ohio	656	Deibel Labs	1.15	positive
140	S. Onderstepoort	2692	CDC	1.63	positive
141	S. Oranienberg	2511	CDC	1.53	positive
142	S. Orion	2880	CDC	1.17	positive
143	S. Oslo	2514	CDC	0.90	positive
144	S. Panama	2593	CDC	1.04	positive

145	S. Paratyphi-A	2403	CDC	0.92	positive
146	S. Paratyphi-B	2309	CDC	1.43	positive
147	S. Paratyphi-C	2528	CDC	0.72	positive ^b
148	S. Pensacola	2615	CDC	1.55	positive
149	S. Pomona	2724	CDC	1.28	positive
150	S. Poona	2680	CDC	1.60	positive
151	S. Potsdam	2515	CDC	1.53	positive
152	S. Pretoria	1857	CDC	1.60	positive
153	S. Pullorum	2885	CDC	1.47	positive ^b
154	S. Pullorum	887	CDC	1.29	positive ^b
155	S. Quimbamba	3073	CDC	1.17	positive
156	S. Quinhon	3074	CDC	0.55	positive
157	S. Ramatgan	3022	CDC	1.68	positive
158	S. Reading	2314	CDC	1.20	positive
159	S. Riogrande	3057	CDC	0.32	positive
160	S. Rostock	2616	CDC	0.94	positive
161	S. Rubislaw	2703	CDC	0.34	positive
162	S. Rutgers	3179	CDC	1.39	positive
163	S. Saint-Paul	2360	CDC	1.58	positive
164	S. San Diego	2363	CDC	0.65	positive
165	S. Saphra	907	CDC	0.66	positive
166	S. Schleissheim	2396	CDC	1.26	positive
167	S. Schwarzengrund	546	Mass. State Lab	1.06	positive
168	S. Sendai	2911	CDC	0.57	positive
169	S. Senftenberg	653	Deibel Labs	1.24	positive
170	S. Senftenberg	2883	CDC	1.31	positive
171	S. Simsbury	3178	CDC	1.23	positive
172	S. Soerenge	3023	CDC	0.98	positive
173	S. Springs	3058	CDC	1.58	positive
174	S. Stanley	2364	CDC	0.59	positive
175	S. Stanleyville	909	CDC	1.28	positive
176	S. Sternchance	3024	CDC	1.32	positive
177	S. Strasbourg	2622	CDC	1.41	positive
178	S. Sunsvall	2713	CDC	1.45	positive
179	S. Tennessee	2516	CDC	1.04	positive
180	S. Thompson	2518	CDC	1.42	positive
181	S. Thompson	2522	CDC	1.48	positive
182	S. Tokai	3092	CDC	0.99	positive
183	S. Tranoroa	3090	CDC	0.79	positive
184	S. Treforest	3136	CDC	1.05	positive
185	S. Tular	2579	CDC	0.72	positive
186	S. Typhi	2125	ATCC 6539	1.33	positive
187	S. Typhimurium	389	ATCC 23566	1.64	positive
188	S. Typhimurium	2366	CDC	1.35	positive
189	S. Typhimurium var. copenhagen	2365	CDC	1.22	positive
190	S. Typhisuis	3240	CDC	1.69	positive ^b
191	S. Urbana	3025	CDC	0.80	positive
192	S. Virchow	2524	CDC	1.31	positive
193	S. Virginia	2882	CDC	1.05	positive
194	S. Wassenaar	3087	CDC	0.21	positive
195	S. Waycross	3059	CDC	1.69	positive
196	S. Wayne	3027	CDC	0.19	positive
197	S. Weltevreden	911	CDC	1.57	positive
198	S. Weslaco	3060	CDC	0.46	positive
199	S. Westerstede	2676	CDC	1.68	positive

200	S. Witchita	2686	CDC	1.63	positive
201	S. Worthington	2687	CDC	1.12	positive

^a Samples producing an absorbance ≥ 0.10 were considered positive.

^b Tested undiluted.

Table 2 Exclusivity Testing Results (1)

	<i>Species</i>	<i>Strain #</i>	<i>Source</i>	<i>Assay Result (~10⁸ cfu)</i> <i>A₄₅₀^a</i>	<i>pos/neg</i>
1	Citrobacter amalonaticus	1485	ATCC 25405	0.01	negative
2	Citrobacter amalonaticus	690	ATCC 25405	-0.04	negative
3	Citrobacter diversus	1475	ATCC 27156	0.00	negative
4	Citrobacter freundii	1476	ATCC 29935	0.01	negative
5	Citrobacter freundii	1477	ATCC 33128	-0.03	negative
6	Citrobacter freundii	1491	ATCC 8090	0.00	negative
7	Citrobacter freundii	679	ATCC 33128	-0.04	negative
8	Edwardsiella hoshinae	1710	ATCC 33379	0.00	negative
9	Edwardsiella tarda	569	ATCC 15947	-0.03	negative
10	Enterobacter aerogenes	1487	ATCC 29940	-0.02	negative
11	Enterobacter agglomerans	1467	ATCC 29917	0.00	negative
12	Enterobacter amnigenus	1482	ATCC 33072	0.03	negative
13	Enterobacter cloacae	1481	ATCC 29941	-0.03	negative
14	Enterobacter gergoviae	1486	ATCC 33028	0.03	negative
15	Enterobacter intermedia	1480	ATCC 33110	0.02	negative
16	Enterobacter sakazakii	1483	ATCC 29544	-0.01	negative
17	Enterobacter taylorae	1497	ATCC 35317	0.02	negative
18	Escherichia blattae	1460	CDC	-0.01	negative
19	Escherichia blattae	4680	EPA	0.03	negative
20	Escherichia coli	1214	ATCC 12036	0.00	negative
21	Escherichia coli	1215	ATCC 19413	-0.02	negative
22	Escherichia coli	1273	UH Cleveland	0.00	negative
23	Escherichia coli	1292	Boston City Hospital	-0.03	negative
24	Escherichia coli	1720	ATCC 25922	0.05	negative
25	Escherichia coli	1723	ATCC 14948	0.05	negative
26	Escherichia fergusonii	1459	ATCC 35473	0.00	negative
27	Escherichia hermannii	1216	ATCC 33650	-0.01	negative
28	Escherichia hermannii	4655	EPA	0.05	negative
29	Escherichia vulneris	1217	ATCC 33821	-0.02	negative
30	Escherichia vulneris	4654	EPA	0.04	negative
31	Hafnia alvei	241	ATCC 29927	0.02	negative
32	Klebsiella oxytoca	1503	ATCC 13182	0.02	negative
33	Klebsiella ozaenae	1499	ATCC 11296	0.00	negative
34	Klebsiella planticola	1478	ATCC 33531	-0.02	negative
35	Klebsiella pneumoniae	1500	ATCC 13883	-0.03	negative
36	Klebsiella pneumoniae	1502	ATCC 29939	-0.04	negative
37	Kluyvera ascorbata	3600	ATCC 33433	0.02	negative
38	Morganella morganii	303	ATCC 25830	0.03	negative
39	Pantoea agglomerans	4361	ATCC 27155	0.04	negative
40	Pasteurella multocida	358	ATCC 19427	0.02	negative
41	Proteus mirabilis	1493	ATCC 25933	0.00	negative
42	Proteus myxofaciens	366	ATCC 19692	0.02	negative
43	Proteus penneri	367	ATCC 33519	0.07	negative
44	Proteus vulgaris	368	ATCC 13315	0.04	negative
45	Providencia alcalifaciens	371	ATCC 9886	0.01	negative
46	Providencia rettgeri	373	ATCC 29944	0.04	negative

47	Providencia rustigiani	374	ATCC 33673	0.00	negative
48	Providencia stuartii	375	ATCC 29914	0.00	negative
49	Pseudomonas aeruginosa	1909	ATCC 27853	0.02	negative
50	Serratia marcesens	392	ATCC 29937	0.00	negative
51	Serratia rubidae	1713	ATCC 15338	0.04	negative

^a Samples producing an absorbance value < 0.10 were considered negative.

Table 3. Results of Inoculated Food Experiments

Food	Inoculum Strain	MPN (cfu/g)	No. Samples	Total Pos. ^a	Samples Positive									Chi square ^e	Chi square ^f
					Microwell Manual		Microwell Automated		Dipstick		BAM ^d				
					Assay ^b	Confirme ^{d c}	Assay ^b	Confirme ^{d c}	Assay ^b	Confirme ^{d c}					
Dry pet food	S. Mbandaka	0.23	20	20	20	20	20	20	20	20	20	20	NA	NA	
		0.23	20	17	15	15	16	16	15	15	17	0.50	0.00		
		uninoculated	10	0	0	0	2	0	0	0	0	0	NA	NA	
Cake mix	S. Rubislaw	0.43	20	20	20	20	20	20	20	20	20	20	NA	NA	
		0.23	20	19	19	19	19	19	19	19	19	19	NA	NA	
		uninoculated	10	0	0	0	0	0	2	0	0	0	NA	NA	
Raw pork 1	S. Typhimurium	0.43	20	20	20	20	20	20	20	20	20	20	NA	NA	
		0.23	20	20	20	20	20	20	20	20	20	20	NA	NA	
		uninoculated	10	0	0	0	2	0	0	0	0	0	NA	NA	
Raw pork 2	S. Typhimurium	0.43	20	20	20	20	20	20	20	20	20	20	NA	NA	
		0.04	20	15	15	15	15	15	15	15	15	15	NA	NA	
		uninoculated	10	0	2	0	0	0	1	0	0	0	NA	NA	
Beef franks 1	S. Agona	1.49	20	20	20	20	20	20	20	20	20	20	NA	NA	
		0.09	20	20	20	20	20	20	20	20	20	20	NA	NA	
		uninoculated	10	0	1	0	0	0	0	0	0	0	NA	NA	
Beef Franks 2	S. Agona	0.11	20	20	20	20	20	20	20	20	20	20	NA	NA	
		0.00	20	4	4	4	4	4	4	4	4	4	NA	NA	
		uninoculated	10	0	0	0	0	0	0	0	0	0	NA	NA	
Walnuts	S. Javiana	0.93	20	20	20	20	20	20	20	20	20	20	NA	NA	
		2.40	20	20	20	20	20	20	20	20	18	0.50	0.50		
		uninoculated	10	0	0	0	0	0	0	0	0	0	NA	NA	
Dried Fruit	S. California	4.62	20	20	20	20	20	20	20	20	20	20	NA	NA	
		0.21	20	19	19	19	18	18	19	19	19	0.00	0.00		
		uninoculated	10	0	0	0	4	0	0	0	0	0	NA	NA	
Black Pepper 1	S. Newbrunswick	0.75	20	20	20	20	20	20	20	20	20	20	NA	NA	
		0.23	20	20	20	20	20	20	20	20	20	20	NA	NA	
		uninoculated	10	0	0	0	1	0	0	0	0	0	NA	NA	

Black Pepper 2	S. Newbrunswick	0.09	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.00	20	8	8	8	8	8	8	8	8	8	NA	NA
		uninoculated	10	0	1	0	1	0	0	0	0	0	NA	NA
Raw Fish	S. Worthington	0.43	20	19	19	19	19	19	19	19	19	19	NA	NA
		0.00	20	7	8	7	10	7	7	7	7	7	NA	NA
		uninoculated	10	0	0	0	1	0	0	0	0	0	NA	NA
Raw Turkey	S. Oranienburg	0.43	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.04	20	14	14	14	14	14	15	14	14	14	NA	NA
		uninoculated	10	1	1	1	1	1	4	1	1	1	NA	NA
Mushrooms	S. Montevideo	4.62	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.07	20	14	13	13	13	13	14	13	11	11	0.25	0.25
		uninoculated	10	0	1	0	0	0	0	0	0	0	NA	NA
Dried whole egg	S. Infantis	1.49	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.04	20	19	19	19	20	19	19	19	19	19	NA	NA
		uninoculated	10	0	0	0	0	0	0	0	0	0	NA	NA
Frozen fruit	S. Heidelberg	0.75	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.00	20	7	7	7	8	7	8	7	7	7	NA	NA
		uninoculated	10	0	0	0	0	0	0	0	0	0	NA	NA
Nonfat dry milk	S. Madelia	0.93	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.43	20	18	19	18	19	18	18	18	18	18	NA	NA
		uninoculated	10	0	0	0	1	0	0	0	0	0	NA	NA
Surimi 1	S. Blukwa	0.93	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.15	20	20	20	20	20	20	20	20	20	20	NA	NA
		uninoculated	10	0	0	0	0	0	0	0	0	0	NA	NA
Surimi 2	S. Blukwa	11.00	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.43	20	17	17	17	17	17	17	17	17	17	NA	NA
		uninoculated	10	0	0	0	2	0	0	0	0	0	NA	NA
Chocolate	S. Kentucky	0.09	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.00	20	13	12	11	12	11	12	11	13	13	0.50	0.50
		uninoculated	10	0	2	0	0	0	1	0	0	0	NA	NA
Refrig. Dough	S. Marshall	0.23	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.04	20	13	13	13	13	13	15	13	13	13	NA	NA
		uninoculated	10	0	0	0	0	0	3	0	0	0	NA	NA
Soy Flour	S. Gaminara	0.93	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.04	20	20	18	18	16	16	18	18	20	20	0.50	2.25
		uninoculated	10	0	0	0	0	0	0	0	0	0	NA	NA

Egg Noodles 1	S. Cerro	11.00	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.39	20	20	20	20	20	20	20	20	20	20	NA	NA
		uninoculated	10	0	0	0	0	0	0	1	0	0	NA	NA
Egg Noodles 2	S. Cerro	4.62	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.43	20	20	20	20	20	20	20	20	20	20	NA	NA
		uninoculated	10	0	0	0	0	0	0	2	0	0	NA	NA
Cheese Powder	S. Kirkee	0.93	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.15	20	16	17	16	16	16	16	16	16	16	NA	NA
		uninoculated	10	0	0	0	0	0	0	0	0	0	NA	NA
Food Dye	S. Illinois	0.03	20	20	20	20	20	20	20	20	20	20	NA	NA
		0.00	20	0	0	0	2	0	1	0	0	0	NA	NA
		uninoculated	10	0	0	0	0	0	0	0	0	0	NA	NA
TOTALS			1250	880	884	873	894	871	893	873	875			

^a Number of samples confirmed positive by one or more methods.

^b Number of samples positive by DNA hybridization assay not considering subsequent culture confirmation.

^c Number of samples positive by DNA hybridization assay and confirmed by plating from associated cultures.

^d Number of samples positive by BAM/AOAC culture method.

^e Chi square value by McNemar's test comparing confirmed manual DNA hybridization assay and BAM/AOAC culture method.

^f Chi square value by McNemar's test comparing confirmed automated DNA hybridization assay and BAM/AOAC culture method.

REFERENCES CITED

1. Durbin, G.W., Gwozdowski, K.S., Bird, C.B., and Mozola, M., Evaluation of the Comparative Study of a Microwell-Format DNA Probe Assay and Conventional Culture for the Detection of *Salmonella* spp. In Foods, AOAC® *Performance TestedSM* certification number 030201.
2. U.S. Food and Drug Administration. 1998. *Bacteriological Analytical Manual*, 8th ed., Rev. A, AOAC International, Gaithersburg, MD, Chapter 5.
3. U.S. Food and Drug Administration. 1998. *Bacteriological Analytical Manual*, 8th ed., Rev. A, AOAC International, Gaithersburg, MD, Chapter 1.
4. Siegel, S. 1956. *Nonparametric Statistics for the Behavioral Sciences*, McGraw Hill Book Co., New York, NY, p. 63-67.
5. Siegel, S. 1956. *Nonparametric Statistics for the Behavioral Sciences*, McGraw Hill Book Co., New York, NY, p. 107-109.