

Are Dogs Suitable Proxies for Humans in Archaeological Isotopic Dietary Assessments?
Bayesian Analyses of Bone Collagen Stable Isotope Ratios from Ancestral Huron-Wendat Sites

Supplementary Data S1
Model Summary Statistics and Diagnostics

John P. Hart
Research and Collections Division
New York State Museum
Albany, New York 12203

Source	Consumer	Mean $\pm 1\sigma$	2.5%	5%	25%	50%	75%	95%	97.5%
14 th century human (n=23), dog (n=13)									
High $\delta^{15}\text{N}$ Fish	Human a	0.226 ± 0.073	0.055	0.088	0.181	0.235	0.281	0.329	0.343
	Dog	0.035 ± 0.029	0.001	0.002	0.012	0.028	0.051	0.092	0.106
Low $\delta^{15}\text{N}$ Fish	Human	0.058 ± 0.041	0.005	0.009	0.038	0.077	0.128	0.206	0.231
	Dog b	0.140 ± 0.114	0.004	0.009	0.049	0.111	0.205	0.366	0.421
Maize	Human	0.473 ± 0.028	0.417	0.427	0.455	0.474	0.492	0.518	0.526
	Dog	0.497 ± 0.043	0.409	0.426	0.471	0.498	0.524	0.562	0.576
Medium $\delta^{15}\text{N}$ Fish	Human a	0.155 ± 0.111	0.008	0.015	0.064	0.132	0.227	0.369	0.406
	Dog	0.057 ± 0.046	0.002	0.004	0.020	0.045	0.083	0.145	0.162
Terrestrial	Human	0.058 ± 0.041	0.002	0.004	0.023	0.050	0.085	0.136	0.150
	Dog b	0.272 ± 0.099	0.041	0.075	0.212	0.285	0.344	0.414	0.429
15 th century human (n=22), dog (n=19)									
High $\delta^{15}\text{N}$ Fish	Human c	0.193 ± 0.082	0.026	0.047	0.135	0.200	0.254	0.318	0.339
	Dog	0.019 ± 0.016	0.000	0.001	0.007	0.015	0.028	0.052	0.060
Low $\delta^{15}\text{N}$ Fish	Human	0.088 ± 0.067	0.004	0.008	0.035	0.073	0.125	0.219	0.254
	Dog d	0.079 ± 0.076	0.003	0.005	0.022	0.053	0.104	0.216	0.277
Maize	Human	0.508 ± 0.023	0.460	0.469	0.492	0.508	0.523	0.545	0.552
	Dog	0.564 ± 0.027	0.509	0.518	0.546	0.562	0.579	0.600	0.608
Medium $\delta^{15}\text{N}$ Fish	Human c	0.154 ± 0.112	0.007	0.013	0.056	0.133	0.235	0.363	0.387
	Dog	0.028 ± 0.025	0.001	0.002	0.010	0.022	0.041	0.077	0.092
Terrestrial	Human	0.057 ± 0.044	0.002	0.003	0.021	0.049	0.085	0.142	0.159
	Dog d	0.310 ± 0.068	0.158	0.199	0.286	0.328	0.359	0.396	0.406
16 th century human (n=20), dog (n=21)									
High $\delta^{15}\text{N}$ Fish	Human e	0.268 ± 0.082	0.070	0.112	0.220	0.282	0.327	0.379	0.395
	Dog	0.047 ± 0.034	0.002	0.004	0.018	0.041	0.069	0.112	0.127
Low $\delta^{15}\text{N}$ Fish	Human	0.075 ± 0.058	0.002	0.005	0.030	0.062	0.109	0.188	0.214
	Dog f	0.196 ± 0.144	0.007	0.013	0.080	0.167	0.292	0.477	0.517
Maize	Human	0.460 ± 0.024	0.410	0.421	0.444	0.461	0.477	0.499	0.506
	Dog	0.409 ± 0.034	0.315	0.334	0.382	0.412	0.438	0.474	0.485
Medium $\delta^{15}\text{N}$ Fish	Human e	0.142 ± 0.112	0.003	0.007	0.051	0.117	0.208	0.365	0.409
	Dog	0.076 ± 0.056	0.004	0.006	0.030	0.064	0.112	0.183	0.206
Terrestrial	Human	0.055 ± 0.041	0.003	0.005	0.021	0.046	0.080	0.135	0.152
	Dog f	0.272 ± 0.105	0.029	0.068	0.204	0.290	0.351	0.418	0.434
17 th century human (n=16), dog (n=41)									
High $\delta^{15}\text{N}$ Fish	Human g	0.298 ± 0.081	0.107	0.146	0.250	0.308	0.355	0.412	0.429
	Dog	0.016 ± 0.013	0.000	0.001	0.005	0.013	0.024	0.041	0.048
Low $\delta^{15}\text{N}$ Fish	Human	0.064 ± 0.049	0.003	0.005	0.024	0.054	0.094	0.161	0.183
	Dog h	0.070 ± 0.072	0.002	0.004	0.021	0.050	0.095	0.205	0.271
Maize	Human	0.470 ± 0.027	0.414	0.425	0.453	0.470	0.487	0.512	0.522
	Dog	0.527 ± 0.020	0.491	0.504	0.524	0.538	0.551	0.568	0.574
Medium $\delta^{15}\text{N}$ Fish	Human g	0.124 ± 0.096	0.005	0.008	0.046	0.103	0.180	0.315	0.359
	Dog	0.025 ± 0.022	0.000	0.001	0.007	0.019	0.037	0.067	0.077
Terrestrial	Human	0.045 ± 0.034	0.002	0.004	0.017	0.037	0.065	0.111	0.126
	Dog h	0.352 ± 0.060	0.189	0.241	0.328	0.363	0.390	0.423	0.432

S1 Table 1. Dog and human MixSIAR Model 1 means and quantiles by century. Letters adjacent to means indicate sources with strong negative correlations (see text for explanation)

Consumer	Species	Mean $\pm 1\sigma$	2.5%	5%	25%	50%	75%	95%	97.5%
14 th century human (n=23), dog (n=13)									
High $\delta^{15}\text{N}$ Fish	Human a	0.226 ± 0.073	0.055	0.088	0.181	0.235	0.281	0.329	0.343
	Dog	0.029 ± 0.025	0.001	0.002	0.010	0.023	0.042	0.077	0.093
Low $\delta^{15}\text{N}$ Fish	Human b	0.058 ± 0.041	0.005	0.009	0.038	0.077	0.128	0.206	0.231
	Dog	0.121 ± 0.105	0.005	0.009	0.040	0.092	0.178	0.337	0.388
Maize	Human	0.473 ± 0.028	0.417	0.427	0.455	0.474	0.492	0.518	0.526
	Dog c	0.445 ± 0.061	0.312	0.339	0.408	0.451	0.486	0.533	0.547
Med. $\delta^{15}\text{N}$ Fish	Human a	0.155 ± 0.111	0.008	0.015	0.064	0.132	0.227	0.369	0.406
	Dog	0.046 ± 0.040	0.002	0.003	0.016	0.035	0.064	0.125	0.148
Terrestrial	Human	0.058 ± 0.041	0.002	0.004	0.023	0.050	0.085	0.136	0.150
	Dog b	0.256 ± 0.092	0.040	0.075	0.203	0.269	0.321	0.387	0.411
Human Feces	Dog c	0.103 ± 0.088	0.003	0.007	0.034	0.080	0.148	0.272	0.326
15 th century human (n=22), dog (n=19)									
High $\delta^{15}\text{N}$ Fish	Human d	0.193 ± 0.082	0.026	0.047	0.135	0.200	0.254	0.318	0.339
	Dog	0.015 ± 0.014	0.000	0.001	0.005	0.012	0.022	0.043	0.050
Low $\delta^{15}\text{N}$ Fish	Human	0.088 ± 0.067	0.004	0.008	0.035	0.073	0.125	0.219	0.254
	Dog e	0.068 ± 0.070	0.001	0.002	0.019	0.047	0.094	0.211	0.268
Maize	Human	0.508 ± 0.023	0.460	0.469	0.492	0.508	0.523	0.545	0.552
	Dog	0.524 ± 0.041	0.430	0.450	0.501	0.530	0.553	0.581	0.589
Med. $\delta^{15}\text{N}$ Fish	Human d	0.154 ± 0.112	0.007	0.013	0.056	0.133	0.235	0.363	0.387
	Dog	0.025 ± 0.022	0.001	0.002	0.008	0.019	0.036	0.069	0.084
Terrestrial	Human	0.057 ± 0.044	0.002	0.003	0.021	0.049	0.085	0.142	0.159
	Dog e	0.299 ± 0.064	0.136	0.178	0.270	0.310	0.342	0.379	0.391
Human Feces	Dog	0.068 ± 0.059	0.002	0.004	0.023	0.051	0.098	0.187	0.268
16 th century human (n=20), dog (n=21)									
High $\delta^{15}\text{N}$ Fish	Human f	0.268 ± 0.082	0.070	0.112	0.220	0.282	0.327	0.379	0.395
	Dog	0.038 ± 0.029	0.002	0.003	0.014	0.031	0.055	0.096	0.109
Low $\delta^{15}\text{N}$ Fish	Human	0.075 ± 0.058	0.002	0.005	0.030	0.062	0.109	0.188	0.214
	Dog g	0.157 ± 0.128	0.004	0.010	0.055	0.123	0.227	0.421	0.479
Maize	Human	0.460 ± 0.024	0.410	0.421	0.444	0.461	0.477	0.499	0.506
	Dog h	0.356 ± 0.058	0.231	0.249	0.319	0.362	0.397	0.442	0.455
Med. $\delta^{15}\text{N}$ Fish	Human f	0.142 ± 0.112	0.003	0.007	0.051	0.117	0.208	0.365	0.409
	Dog	0.057 ± 0.047	0.002	0.004	0.019	0.045	0.082	0.150	0.173
Terrestrial	Human	0.055 ± 0.041	0.003	0.005	0.021	0.046	0.080	0.135	0.152
	Dog g	0.273 ± 0.096	0.046	0.081	0.217	0.289	0.343	0.403	0.421
Human Feces	Dog h	0.121 ± 0.097	0.005	0.010	0.043	0.097	0.176	0.317	0.364
17 th century human (n=16), dog (n=41)									
High $\delta^{15}\text{N}$ Fish	Human i	0.298 ± 0.081	0.107	0.146	0.250	0.308	0.355	0.412	0.429
	Dog	0.014 ± 0.012	0.000	0.001	0.005	0.011	0.020	0.038	0.045
Low $\delta^{15}\text{N}$ Fish	Human	0.064 ± 0.049	0.003	0.005	0.024	0.054	0.094	0.161	0.183
	Dog j	0.055 ± 0.058	0.002	0.003	0.016	0.037	0.077	0.168	0.214
Maize	Human	0.470 ± 0.027	0.414	0.425	0.453	0.470	0.487	0.512	0.522
	Dog k	0.510 ± 0.029	0.446	0.458	0.491	0.514	0.531	0.553	0.559
Med. $\delta^{15}\text{N}$ Fish	Human i	0.124 ± 0.096	0.005	0.008	0.046	0.103	0.180	0.315	0.359
	Dog	0.022 ± 0.019	0.001	0.001	0.008	0.017	0.031	0.058	0.070
Terrestrial	Human	0.045 ± 0.034	0.002	0.004	0.017	0.037	0.065	0.111	0.126
	Dog j	0.345 ± 0.051	0.221	0.255	0.322	0.354	0.377	0.409	0.420
Human Feces	Dog k	0.054 ± 0.058	0.002	0.004	0.019	0.042	0.079	0.143	0.166

S1 Table 2. MixSIAR human model 1 and dog model 2 means and quantiles by century. Letters adjacent to means indicate sources with strong negative correlations (see text for explanation)

	Model	Mean $\pm 1\sigma$	2.5%	5%	25%	50%	75%	95%	97.5%
14 th century human (n=23), dog (n=13)									
High $\delta^{15}\text{N}$ Fish	Human a	0.226 $\pm$ 0.073	0.055	0.088	0.181	0.235	0.281	0.329	0.343
	Dog	0.024 $\pm$ 0.022	0.000	0.001	0.008	0.018	0.034	0.070	0.084
Low $\delta^{15}\text{N}$ Fish	Human	0.058 $\pm$ 0.041	0.005	0.009	0.038	0.077	0.128	0.206	0.231
	Dog b	0.110 $\pm$ 0.101	0.002	0.005	0.032	0.080	0.157	0.320	0.378
Maize	Human	0.473 $\pm$ 0.028	0.417	0.427	0.455	0.474	0.492	0.518	0.526
	Dog c	0.437 $\pm$ 0.061	0.300	0.329	0.401	0.443	0.480	0.529	0.546
Med. $\delta^{15}\text{N}$ Fish	Human a	0.155 $\pm$ 0.111	0.008	0.015	0.064	0.132	0.227	0.369	0.406
	Dog	0.040 $\pm$ 0.036	0.001	0.002	0.013	0.030	0.059	0.113	0.136
Terrestrial	Human	0.058 $\pm$ 0.041	0.002	0.004	0.023	0.050	0.085	0.136	0.150
	Dog b	0.269 $\pm$ 0.094	0.052	0.086	0.212	0.283	0.335	0.404	0.425
Human Feces	Dog c	0.103 $\pm$ 0.088	0.003	0.007	0.034	0.080	0.148	0.272	0.326
Micomammals	Dog	0.029 $\pm$ 0.026	0.001	0.002	0.010	0.021	0.040	0.080	0.098
15 th century human (n=22), dog (n=19)									
High $\delta^{15}\text{N}$ Fish	Human d	0.193 $\pm$ 0.082	0.026	0.047	0.135	0.200	0.254	0.318	0.339
	Dog	0.013 $\pm$ 0.012	0.000	0.001	0.004	0.010	0.019	0.036	0.043
Low $\delta^{15}\text{N}$ Fish	Human	0.088 $\pm$ 0.067	0.004	0.008	0.035	0.073	0.125	0.219	0.254
	Dog e	0.058 $\pm$ 0.064	0.002	0.004	0.016	0.038	0.075	0.186	0.252
Maize	Human	0.508 $\pm$ 0.023	0.460	0.469	0.492	0.508	0.523	0.545	0.552
	Dog f	0.534 $\pm$ 0.040	0.429	0.453	0.500	0.528	0.551	0.581	0.591
Med. $\delta^{15}\text{N}$ Fish	Human d	0.154 $\pm$ 0.112	0.007	0.013	0.056	0.133	0.235	0.363	0.387
	Dog	0.022 $\pm$ 0.020	0.000	0.001	0.008	0.017	0.032	0.061	0.074
Terrestrial	Human	0.057 $\pm$ 0.044	0.002	0.003	0.021	0.049	0.085	0.142	0.159
	Dog e	0.304 $\pm$ 0.064	0.134	0.184	0.277	0.315	0.346	0.385	0.396
Human Feces	Dog f	0.070 $\pm$ 0.061	0.002	0.004	0.023	0.054	0.101	0.192	0.225
Micomammals	Dog	0.015 $\pm$ 0.014	0.000	0.001	0.005	0.011	0.022	0.043	0.052
16 th century human (n=20), dog (n=21)									
High $\delta^{15}\text{N}$ Fish	Human g	0.268 $\pm$ 0.082	0.070	0.112	0.220	0.282	0.327	0.379	0.395
	Dog	0.031 $\pm$ 0.026	0.001	0.002	0.010	0.025	0.045	0.083	0.098
Low $\delta^{15}\text{N}$ Fish	Human	0.075 $\pm$ 0.058	0.002	0.005	0.030	0.062	0.109	0.188	0.214
	Dog h	0.148 $\pm$ 0.131	0.004	0.008	0.045	0.108	0.219	0.423	0.470
Maize	Human	0.460 $\pm$ 0.024	0.410	0.421	0.444	0.461	0.477	0.499	0.506
	Dog i	0.346 $\pm$ 0.057	0.222	0.245	0.310	0.351	0.385	0.430	0.444
Med. $\delta^{15}\text{N}$ Fish	Human g	0.142 $\pm$ 0.112	0.003	0.007	0.051	0.117	0.208	0.365	0.409
	Dog	0.045 $\pm$ 0.040	0.001	0.002	0.014	0.034	0.067	0.124	0.146
Terrestrial	Human	0.055 $\pm$ 0.041	0.003	0.005	0.021	0.046	0.080	0.135	0.152
	Dog h	0.295 $\pm$ 0.106	0.038	0.076	0.238	0.314	0.371	0.438	0.456
Human Feces	Dog i	0.121 $\pm$ 0.097	0.005	0.010	0.043	0.097	0.176	0.317	0.364
Micomammals	Dog	0.035 $\pm$ 0.031	0.001	0.002	0.010	0.027	0.052	0.096	0.110
17 th century human (n=16), dog (n=41)									
High $\delta^{15}\text{N}$ Fish	Human j	0.298 $\pm$ 0.081	0.107	0.146	0.250	0.308	0.355	0.412	0.429
	Dog	0.012 $\pm$ 0.011	0.000	0.001	0.004	0.009	0.017	0.033	0.040
Low $\delta^{15}\text{N}$ Fish	Human	0.064 $\pm$ 0.049	0.003	0.005	0.024	0.054	0.094	0.161	0.183
	Dog k	0.052 $\pm$ 0.059	0.001	0.002	0.014	0.033	0.068	0.160	0.219
Maize	Human	0.470 $\pm$ 0.027	0.414	0.425	0.453	0.470	0.487	0.512	0.522
	Dog l	0.508 $\pm$ 0.029	0.443	0.457	0.491	0.511	0.528	0.549	0.556
Med. $\delta^{15}\text{N}$ Fish	Human j	0.124 $\pm$ 0.096	0.005	0.008	0.046	0.103	0.180	0.315	0.359
	Dog	0.019 $\pm$ 0.017	0.000	0.001	0.006	0.014	0.026	0.052	0.061
Terrestrial	Human	0.022 $\pm$ 0.019	0.001	0.001	0.008	0.017	0.031	0.058	0.070
	Dog k	0.351 $\pm$ 0.054	0.213	0.257	0.330	0.361	0.385	0.416	0.424
Human Feces	Dog l	0.054 $\pm$ 0.045	0.002	0.004	0.019	0.042	0.079	0.143	0.166
Micomammals	Dog	0.013 $\pm$ 0.012	0.000	0.001	0.004	0.010	0.018	0.036	0.042

S1 Table 3. MixSIAR human model 1 and dog 3 means and quantiles by century. Letters adjacent to model sources indicate sources with strong negative correlations (see text for explanation)

Source	Consumer	Mean±1σ	2.5%	5%	25%	50%	75%	95%	97.5%
Fairty ossuary human (n=8)-Robb village dog (n=9), 14 th century AD									
HighN_Fish	Human	0.142±0.076	0.010	0.019	0.085	0.142	0.197	0.266	0.288
	Dog	0.030±0.026	0.001	0.002	0.010	0.024	0.044	0.080	0.094
LowN_Fish	Human	0.111±0.085	0.003	0.007	0.043	0.095	0.161	0.275	0.311
	Dog a	0.146±0.125	0.005	0.008	0.045	0.112	0.215	0.400	0.445
Maize	Human	0.514±0.053	0.402	0.426	0.482	0.517	0.548	0.595	0.607
	Dog	0.468±0.048	0.375	0.390	0.438	0.468	0.498	0.546	0.560
MedN_Fish	Human	0.148±0.106	0.005	0.010	0.059	0.132	0.223	0.347	0.385
	Dog	0.051±0.045	0.002	0.003	0.018	0.039	0.072	0.139	0.165
Terrestrial	Human	0.085±0.065	0.003	0.007	0.032	0.072	0.124	0.211	0.243
	Dog a	0.305±0.122	0.042	0.070	0.225	0.326	0.396	0.477	0.498
Kleinberg ossuary human (n=12)-Seed Barker village dog (n=5), 16 th century AD									
HighN_Fish	Human b	0.290±0.124	0.069	0.100	0.206	0.264	0.312	0.366	0.382
	Dog	0.063±0.056	0.002	0.004	0.021	0.048	0.090	0.175	0.211
LowN_Fish	Human	0.088±0.080	0.003	0.006	0.031	0.067	0.116	0.195	0.225
	Dog c	0.178±0.131	0.007	0.014	0.066	0.152	0.263	0.419	0.470
Maize	Human	0.408±0.081	0.381	0.395	0.433	0.457	0.480	0.515	0.526
	Dog	0.438±0.076	0.268	0.308	0.397	0.442	0.486	0.553	0.578
MedN_Fish	Human b	0.142±0.114	0.006	0.011	0.056	0.125	0.217	0.360	0.406
	Dog	0.101±0.087	0.003	0.006	0.034	0.077	0.144	0.272	0.321
Terrestrial	Human	0.072±0.065	0.002	0.005	0.024	0.054	0.094	0.159	0.177
	Dog c	0.220±0.126	0.016	0.028	0.117	0.213	0.316	0.431	0.465
Ball village human (n=6), dog (n=12), 16 th century AD									
HighN_Fish	Human	0.185±0.107	0.010	0.021	0.101	0.182	0.263	0.364	0.397
	Dog	0.062±0.046	0.002	0.005	0.025	0.052	0.090	0.148	0.169
LowN_Fish	Human	0.127±0.104	0.004	0.010	0.046	0.099	0.187	0.332	0.389
	Dog d	0.234±0.165	0.009	0.019	0.095	0.205	0.353	0.538	0.592
Maize	Human	0.419±0.069	0.271	0.300	0.379	0.424	0.464	0.523	0.540
	Dog	0.311±0.062	0.183	0.207	0.273	0.313	0.351	0.409	0.430
MedN_Fish	Human	0.165±0.123	0.006	0.013	0.064	0.140	0.241	0.402	0.449
	Dog	0.104±0.079	0.004	0.008	0.040	0.089	0.149	0.252	0.295
Terrestrial	Human	0.104±0.087	0.004	0.007	0.036	0.083	0.147	0.274	0.316
	Dog d	0.289±0.148	0.018	0.040	0.174	0.300	0.402	0.520	0.556
Kelley-Campbell Village human (n=6), dog (n=11), 17 th century AD									
HighN_Fish	Human	0.282±0.112	0.049	0.078	0.207	0.291	0.363	0.451	0.480
	Dog	0.030±0.028	0.000	0.001	0.009	0.023	0.043	0.084	0.100
LowN_Fish	Human	0.078±0.067	0.003	0.005	0.028	0.061	0.109	0.212	0.250
	Dog e	0.112±0.095	0.005	0.009	0.036	0.085	0.163	0.308	0.349
Maize	Human	0.449±0.067	0.305	0.335	0.411	0.452	0.491	0.550	0.576
	Dog	0.573±0.049	0.462	0.486	0.546	0.576	0.605	0.646	0.662
MedN_Fish	Human	0.151±0.111	0.007	0.014	0.062	0.126	0.224	0.367	0.406
	Dog	0.050±0.044	0.002	0.004	0.018	0.039	0.070	0.133	0.162
Terrestrial	Human	0.054±0.048	0.001	0.003	0.018	0.041	0.077	0.146	0.180
	Dog e	0.235±0.088	0.043	0.065	0.178	0.248	0.299	0.358	0.375
Ossossané ossuary human (n=5)-Ossossané village dog (n=11), 17 th century AD									
HighN_Fish	Human	0.182±0.105	0.010	0.022	0.098	0.179	0.255	0.360	0.390
	Dog	0.047±0.037	0.001	0.003	0.018	0.040	0.068	0.116	0.132
LowN_Fish	Human	0.116±0.093	0.006	0.009	0.042	0.096	0.164	0.294	0.343
	Dog e	0.164±0.109	0.009	0.015	0.072	0.150	0.243	0.360	0.388
Maize	Human	0.463±0.074	0.297	0.336	0.421	0.469	0.511	0.570	0.590
	Dog	0.541±0.042	0.451	0.472	0.516	0.542	0.569	0.607	0.618
MedN_Fish	Human	0.151±0.111	0.007	0.014	0.062	0.126	0.224	0.367	0.406
	Dog	0.077±0.061	0.003	0.006	0.030	0.064	0.110	0.195	0.226
Terrestrial	Human	0.088±0.075	0.003	0.006	0.031	0.069	0.128	0.239	0.278
	Dog e	0.170±0.094	0.007	0.017	0.093	0.173	0.244	0.318	0.339

S1 Table 4. Dog and human MixSIAR Model 1 results means and quantiles by sites. Letters adjacent to means indicate sources with strong negative correlations (see text for explanation).

Source	Consumer	Mean±1σ	2.5%	5%	25%	50%	75%	95%	97.5%
Fairty ossuary human (n=8)-Robb village dog (n=9), 14 th century AD									
High δ ¹⁵ N Fish	Human a	0.226±0.073	0.055	0.088	0.181	0.235	0.281	0.329	0.343
	Dog	0.033±0.031	0.001	0.002	0.011	0.024	0.046	0.092	0.111
Low δ ¹⁵ N Fish	Human	0.058±0.041	0.005	0.009	0.038	0.077	0.128	0.206	0.231
	Dog	0.151±0.123	0.004	0.009	0.049	0.121	0.226	0.393	0.437
Maize	Human	0.473±0.028	0.417	0.427	0.455	0.474	0.492	0.518	0.526
	Dog	0.382±0.083	0.200	0.234	0.332	0.388	0.438	0.508	0.531
Med. δ ¹⁵ N Fish	Human a	0.155±0.111	0.008	0.015	0.064	0.132	0.227	0.369	0.406
	Dog	0.054±0.049	0.001	0.003	0.017	0.040	0.077	0.152	0.183
Terrestrial	Human	0.058±0.041	0.002	0.004	0.023	0.050	0.085	0.136	0.150
	Dog	0.257±0.125	0.020	0.040	0.166	0.266	0.349	0.450	0.477
Human Feces	Dog	0.124±0.106	0.004	0.008	0.041	0.095	0.178	0.328	0.392
Kleinberg ossuary human (n=12)-Seed Barker village dog (n=5), 16 th century AD									
High δ ¹⁵ N Fish	Human b	0.193±0.082	0.026	0.047	0.135	0.200	0.254	0.318	0.339
	Dog	0.054±0.049	0.002	0.003	0.018	0.040	0.077	0.152	0.185
Low δ ¹⁵ N Fish	Human	0.088±0.067	0.004	0.008	0.035	0.073	0.125	0.219	0.254
	Dog c	0.150±0.111	0.005	0.011	0.060	0.128	0.221	0.364	0.404
Maize	Human	0.508±0.023	0.460	0.469	0.492	0.508	0.523	0.545	0.552
	Dog d	0.380±0.096	0.165	0.206	0.321	0.390	0.446	0.520	0.546
Med. δ ¹⁵ N Fish	Human b	0.154±0.112	0.007	0.013	0.056	0.133	0.235	0.363	0.387
	Dog	0.084±0.075	0.002	0.006	0.027	0.063	0.121	0.236	0.272
Terrestrial	Human	0.057±0.044	0.002	0.003	0.021	0.049	0.085	0.142	0.159
	Dog c	0.188±0.111	0.011	0.022	0.097	0.183	0.267	0.379	0.412
Human Feces	Dog d	0.143±0.123	0.004	0.009	0.048	0.110	0.206	0.390	0.447
Ball village human (n=6), dog (n=12), 16 th century AD									
High δ ¹⁵ N Fish	Human	0.268±0.082	0.070	0.112	0.220	0.282	0.327	0.379	0.395
	Dog	0.050±0.040	0.002	0.004	0.018	0.040	0.070	0.128	0.146
Low δ ¹⁵ N Fish	Human	0.075±0.058	0.002	0.005	0.030	0.062	0.109	0.188	0.214
	Dog e	0.202±0.147	0.008	0.015	0.080	0.177	0.302	0.483	0.533
Maize	Human	0.460±0.024	0.410	0.421	0.444	0.461	0.477	0.499	0.506
	Dog	0.255±0.073	0.100	0.128	0.208	0.259	0.305	0.368	0.393
Med. δ ¹⁵ N Fish	Human	0.142±0.112	0.003	0.007	0.051	0.117	0.208	0.365	0.409
	Dog	0.081±0.068	0.003	0.005	0.028	0.063	0.117	0.216	0.247
Terrestrial	Human	0.055±0.041	0.003	0.005	0.021	0.046	0.080	0.135	0.152
	Dog e	0.268±0.132	0.026	0.044	0.168	0.271	0.364	0.478	0.509
Human Feces	Dog	0.144±0.118	0.006	0.012	0.051	0.112	0.208	0.380	0.435
Kelley-Campbell Village human (n=6), dog (n=11), 17 th century AD									
HighN_Fish	Human	0.282±0.112	0.049	0.078	0.207	0.291	0.363	0.451	0.480
	Dog	0.028±0.028	0.001	0.002	0.008	0.020	0.039	0.083	0.104
LowN_Fish	Human	0.078±0.067	0.003	0.005	0.028	0.061	0.109	0.212	0.250
	Dog e	0.121±0.102	0.003	0.005	0.038	0.093	0.179	0.323	0.359
Maize	Human	0.449±0.067	0.305	0.335	0.411	0.452	0.491	0.550	0.576
	Dog	0.488±0.073	0.322	0.356	0.447	0.497	0.539	0.590	0.611
MedN_Fish	Human	0.151±0.111	0.007	0.014	0.062	0.126	0.224	0.367	0.406
	Dog	0.046±0.043	0.001	0.003	0.014	0.034	0.065	0.130	0.158
Terrestrial	Human	0.054±0.048	0.001	0.003	0.018	0.041	0.077	0.146	0.180
	Dog e	0.225±0.105	0.017	0.039	0.148	0.235	0.304	0.384	0.405
Human feces	Dog	0.091±0.082	0.003	0.006	0.029	0.068	0.129	0.255	0.305
Ossossané ossuary human (n=5)-Ossossané village dog (n=11), 17 th century AD									
High δ ¹⁵ N Fish	Human	0.298±0.081	0.107	0.146	0.250	0.308	0.355	0.412	0.429
	Dog	0.038±0.033	0.001	0.002	0.013	0.031	0.056	0.101	0.118
Low δ ¹⁵ N Fish	Human	0.064±0.049	0.003	0.005	0.024	0.054	0.094	0.161	0.183
	Dog f	0.127±0.097	0.003	0.006	0.045	0.110	0.195	0.307	0.342
Maize	Human	0.470±0.027	0.414	0.425	0.453	0.470	0.487	0.512	0.522
	Dog g	0.471±0.074	0.295	0.334	0.428	0.482	0.524	0.573	0.587
Med. δ ¹⁵ N Fish	Human	0.124±0.096	0.005	0.008	0.046	0.103	0.180	0.315	0.359
	Dog	0.063±0.053	0.002	0.004	0.022	0.049	0.090	0.165	0.194
Terrestrial	Human	0.045±0.034	0.002	0.004	0.017	0.037	0.065	0.111	0.126
	Dog f	0.173±0.085	0.016	0.029	0.109	0.178	0.237	0.306	0.325
Human Feces	Dog g	0.127±0.110	0.003	0.008	0.042	0.096	0.185	0.350	0.405

S1 Table 5. MixSIAR human model 1 and dog model 2 means and quantiles by sites. Letters adjacent to means indicate sources with strong negative correlations (see text for explanation)

Source	Consumer	Mean±1σ	2.5%	5%	25%	50%	75%	95%	97.5%
Fairty ossuary human (n=8)-Robb village dog (n=9), 14 th century AD									
High δ ¹⁵ N Fish	Human	0.142±0.076	0.010	0.019	0.085	0.142	0.197	0.266	0.288
	Dog	0.039±0.039	0.000	0.001	0.009	0.021	0.040	0.084	0.101
Low δ ¹⁵ N Fish	Human	0.111±0.085	0.003	0.007	0.043	0.095	0.161	0.275	0.311
	Dog a	0.132±0.114	0.004	0.008	0.043	0.100	0.194	0.362	0.416
Maize	Human	0.514±0.053	0.402	0.426	0.482	0.517	0.548	0.595	0.607
	Dog b	0.383±0.087	0.187	0.225	0.330	0.393	0.444	0.512	0.532
Med. δ ¹⁵ N Fish	Human	0.148±0.106	0.005	0.010	0.059	0.132	0.223	0.347	0.385
	Dog	0.048±0.045	0.001	0.003	0.015	0.035	0.067	0.139	0.159
Terrestrial	Human	0.085±0.065	0.003	0.007	0.032	0.072	0.124	0.211	0.243
	Dog a	0.252±0.110	0.030	0.052	0.175	0.260	0.333	0.421	0.445
Human Feces	Dog b	0.124±0.106	0.006	0.009	0.041	0.089	0.166	0.316	0.371
Micomammals	Dog	0.039±0.039	0.001	0.002	0.012	0.029	0.053	0.112	0.140
Kleinberg ossuary human (n=12)-Seed Barker village dog (n=5), 16 th century AD									
High δ ¹⁵ N Fish	Human c	0.253±0.080	0.069	0.100	0.206	0.264	0.312	0.366	0.382
	Dog	0.052±0.050	0.001	0.003	0.017	0.037	0.072	0.146	0.182
Low δ ¹⁵ N Fish	Human	0.079±0.061	0.003	0.006	0.031	0.067	0.116	0.195	0.225
	Dog	0.150±0.113	0.005	0.011	0.056	0.127	0.224	0.372	0.411
Maize	Human	0.456±0.037	0.381	0.395	0.433	0.457	0.480	0.515	0.526
	Dog	0.348±0.116	0.082	0.131	0.278	0.364	0.431	0.511	0.535
Med. δ ¹⁵ N Fish	Human c	0.147±0.110	0.006	0.011	0.056	0.125	0.217	0.360	0.406
	Dog	0.078±0.075	0.002	0.005	0.024	0.054	0.109	0.230	0.279
Terrestrial	Human	0.064±0.049	0.002	0.005	0.024	0.054	0.094	0.159	0.177
	Dog	0.171±0.101	0.010	0.020	0.086	0.168	0.245	0.341	0.372
Human Feces	Dog	0.125±0.109	0.004	0.008	0.041	0.094	0.180	0.345	0.406
Micomammals	Dog	0.076±0.078	0.002	0.004	0.022	0.053	0.103	0.238	0.288
Ball village human (n=6), dog (n=12), 16 th century AD									
High δ ¹⁵ N Fish	Human	0.185±0.107	0.010	0.021	0.101	0.182	0.263	0.364	0.397
	Dog	0.043±0.037	0.001	0.003	0.015	0.033	0.063	0.115	0.133
Low δ ¹⁵ N Fish	Human	0.127±0.104	0.004	0.010	0.046	0.099	0.187	0.332	0.389
	Dog d	0.179±0.139	0.006	0.011	0.065	0.147	0.266	0.446	0.506
Maize	Human	0.419±0.069	0.271	0.300	0.379	0.424	0.464	0.523	0.540
	Dog	0.258±0.076	0.100	0.129	0.209	0.262	0.314	0.377	0.393
Med. δ ¹⁵ N Fish	Human	0.165±0.123	0.006	0.013	0.064	0.140	0.241	0.402	0.449
	Dog	0.071±0.060	0.002	0.004	0.023	0.056	0.100	0.192	0.219
Terrestrial	Human	0.104±0.087	0.004	0.007	0.036	0.083	0.147	0.274	0.316
	Dog d	0.265±0.115	0.033	0.055	0.188	0.272	0.348	0.445	0.472
Human Feces	Dog	0.129±0.111	0.005	0.008	0.042	0.100	0.187	0.351	0.406
Micomammals	Dog	0.055±0.049	0.001	0.003	0.018	0.043	0.078	0.150	0.179
Kelley-Campbell Village human (n=6), dog (n=11), 17 th century AD									
HighN_Fish	Human	0.282±0.112	0.049	0.078	0.207	0.291	0.363	0.451	0.480
	Dog	0.026±0.027	0.000	0.001	0.008	0.018	0.037	0.077	0.095
LowN_Fish	Human	0.078±0.067	0.003	0.005	0.028	0.061	0.109	0.212	0.250
	Dog e	0.098±0.089	0.002	0.005	0.029	0.071	0.142	0.280	0.332
Maize	Human	0.449±0.067	0.305	0.335	0.411	0.452	0.491	0.550	0.576
	Dog	0.495±0.083	0.287	0.345	0.455	0.506	0.551	0.604	0.621
MedN_Fish	Human	0.151±0.111	0.007	0.014	0.062	0.126	0.224	0.367	0.406
	Dog	0.042±0.042	0.001	0.002	0.012	0.029	0.058	0.124	0.155
Terrestrial	Human	0.054±0.048	0.001	0.003	0.018	0.041	0.077	0.146	0.180
	Dog e	0.222±0.088	0.030	0.053	0.168	0.234	0.287	0.347	0.365
Human feces	Dog	0.084±0.077	0.003	0.005	0.027	0.061	0.119	0.231	0.284
Micomammals	Dog	0.033±0.036	0.001	0.002	0.010	0.022	0.044	0.098	0.126
Ossossané ossuary human (n=5)-Ossossané village dog (n=11), 17 th century AD									
High δ ¹⁵ N Fish	Human	0.182±0.105	0.010	0.022	0.098	0.179	0.255	0.360	0.390
	Dog	0.034±0.030	0.001	0.002	0.011	0.026	0.049	0.091	0.111
Low δ ¹⁵ N Fish	Human	0.116±0.093	0.006	0.009	0.042	0.096	0.164	0.294	0.343
	Dog e	0.126±0.096	0.005	0.009	0.047	0.105	0.191	0.305	0.346
Maize	Human	0.463±0.074	0.297	0.336	0.421	0.469	0.511	0.570	0.590
	Dog f	0.463±0.076	0.291	0.326	0.422	0.473	0.518	0.567	0.583
Med. δ ¹⁵ N Fish	Human	0.151±0.111	0.007	0.014	0.062	0.126	0.224	0.367	0.406
	Dog	0.056±0.048	0.002	0.003	0.019	0.043	0.079	0.153	0.180
Terrestrial	Human	0.088±0.075	0.003	0.006	0.031	0.069	0.128	0.239	0.278
	Dog e	0.162±0.077	0.015	0.029	0.107	0.166	0.218	0.285	0.300
Human Feces	Dog f	0.112±0.099	0.003	0.006	0.036	0.085	0.163	0.309	0.367
Micomammals	Dog	0.045±0.044	0.001	0.003	0.014	0.032	0.064	0.129	0.159

S1 Table 6. MixSIAR human model 1 and dog model 3 means and quantiles by site. Letters adjacent to model sources indicate sources with strong negative correlations (see text for explanation)

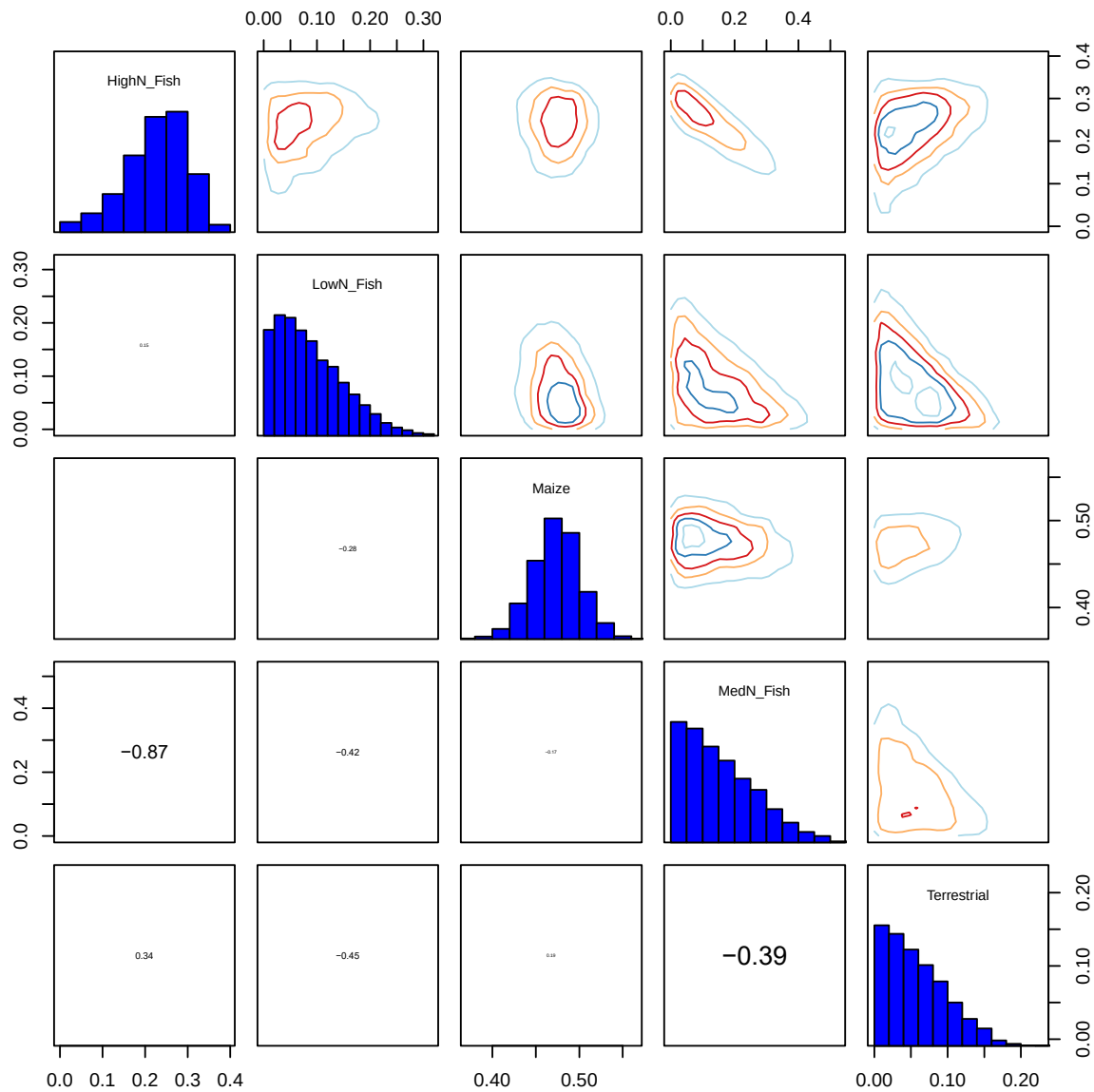
14th Century Human Model Diagnostics (n=23)

Gelman Diagnostic (variables=29)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=29)

Chain 1	Chain 2	Chain 3
1	0	0



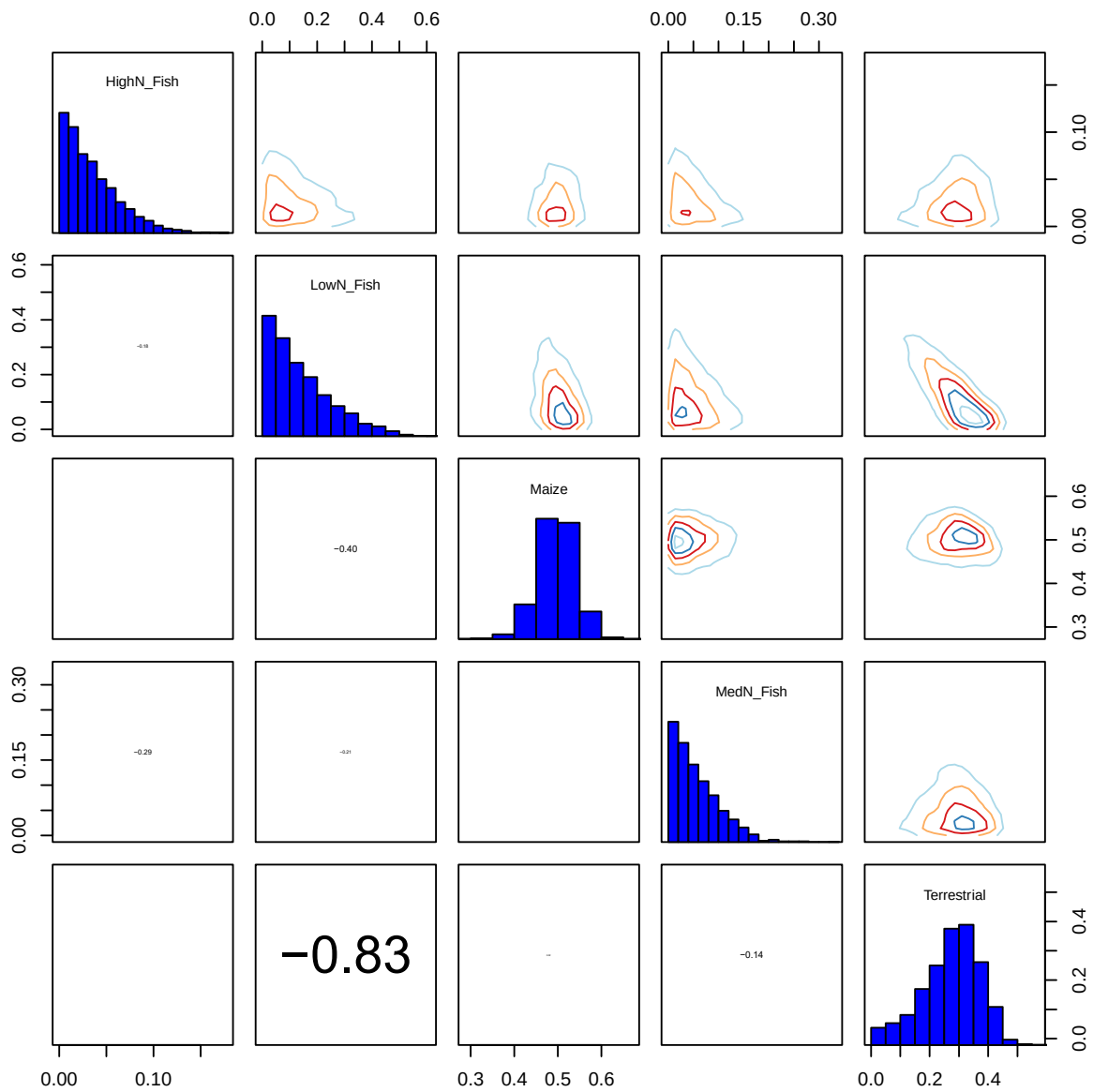
14th Century Dogs Model 1 Diagnostics (n=13)

Gelman Diagnostic (variables=19)

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1	0	0

Geweke diagnostic (variables=19)

Chain 1	Chain 2	Chain 3
0	0	0



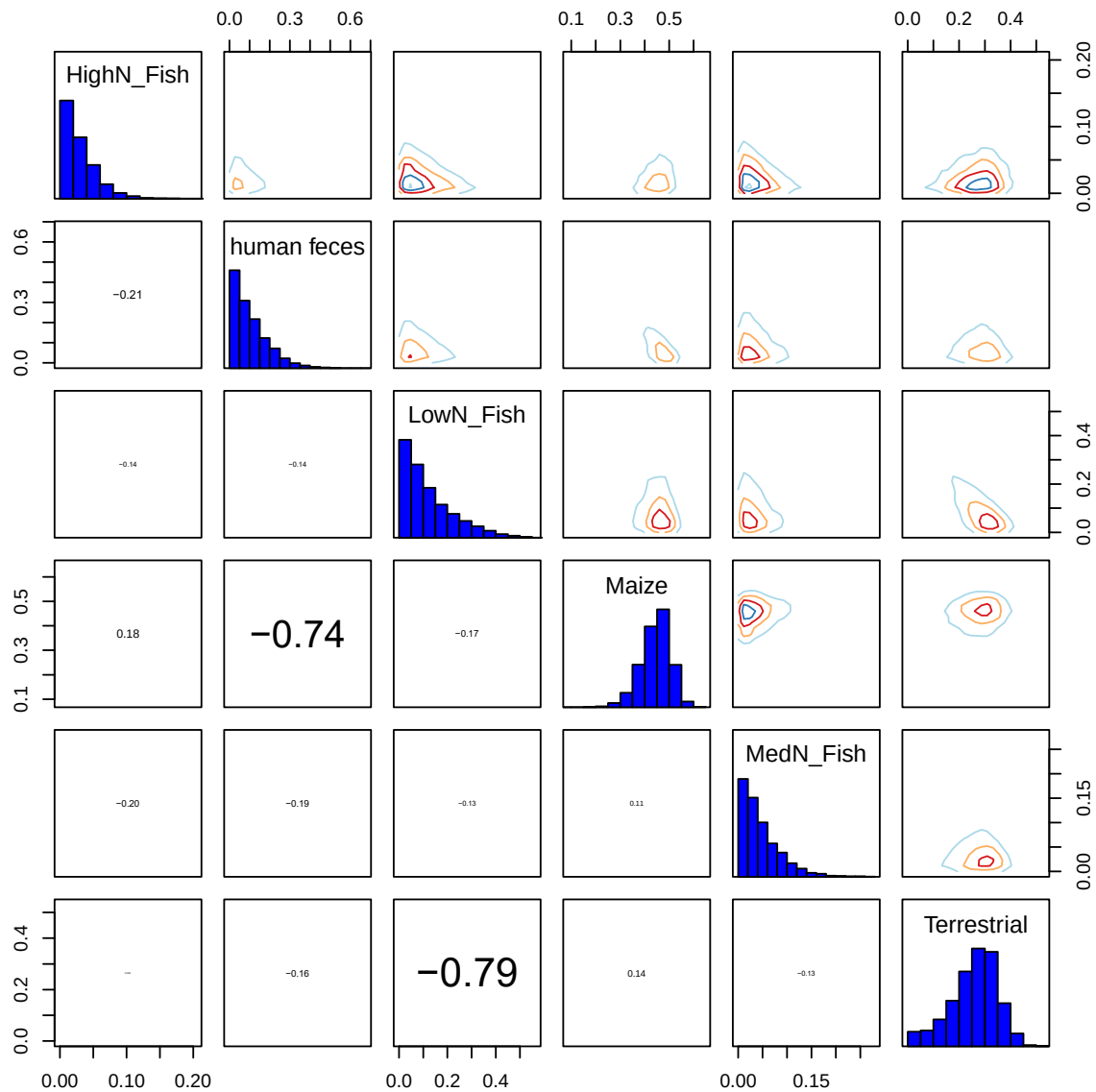
14th Century Dog Model 2 Diagnostics (n=13)

Gelman Diagnostic (variables=20)

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0	0	0

Geweke diagnostic (variables=20)

Chain 1	Chain 2	Chain 3
0	0	0



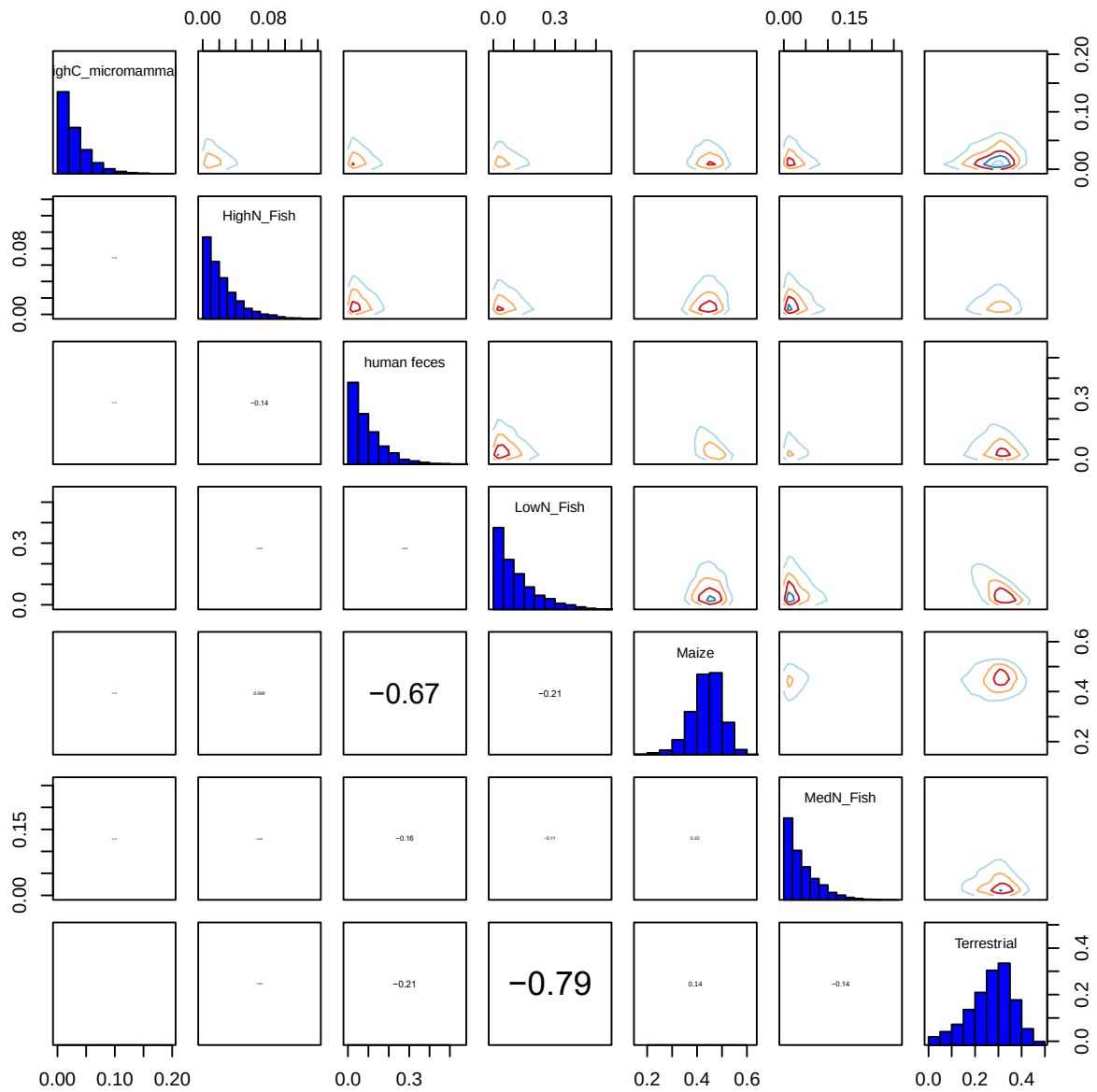
14th Century Dogs Model 3 Diagnostics (n=13)

Gelman Diagnostic (variables=21)

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2	0	0

Geweke diagnostic (variables=21)

Chain 1	Chain 2	Chain 3
0	0	0



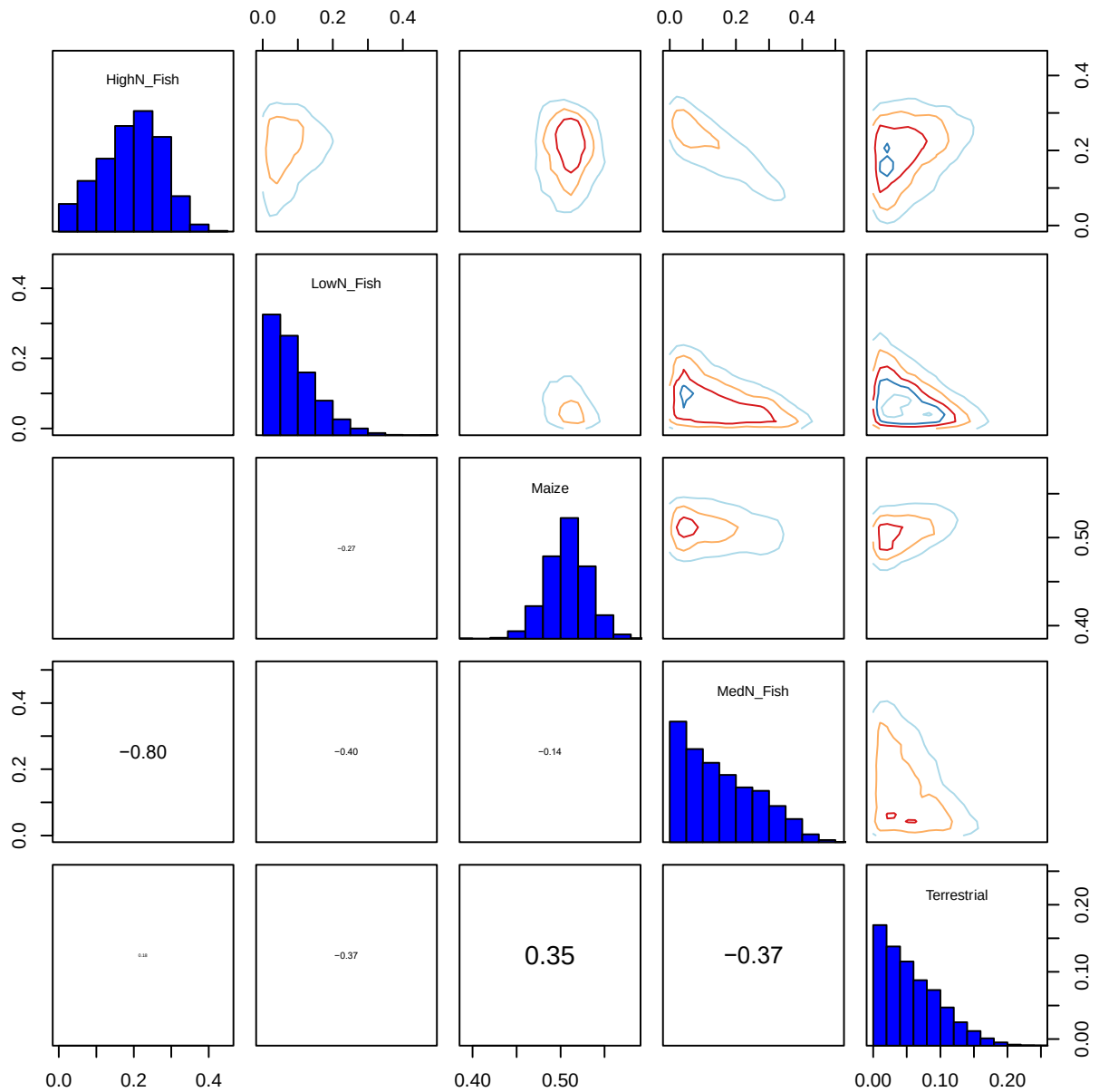
15th Century Human Model Diagnostics (n=22)

Gelman Diagnostic (variables=29)

>1.01	>1.05	>1.10
3	0	0

Geweke diagnostic (variables=29)

Chain 1	Chain 2	Chain 3
1	1	0



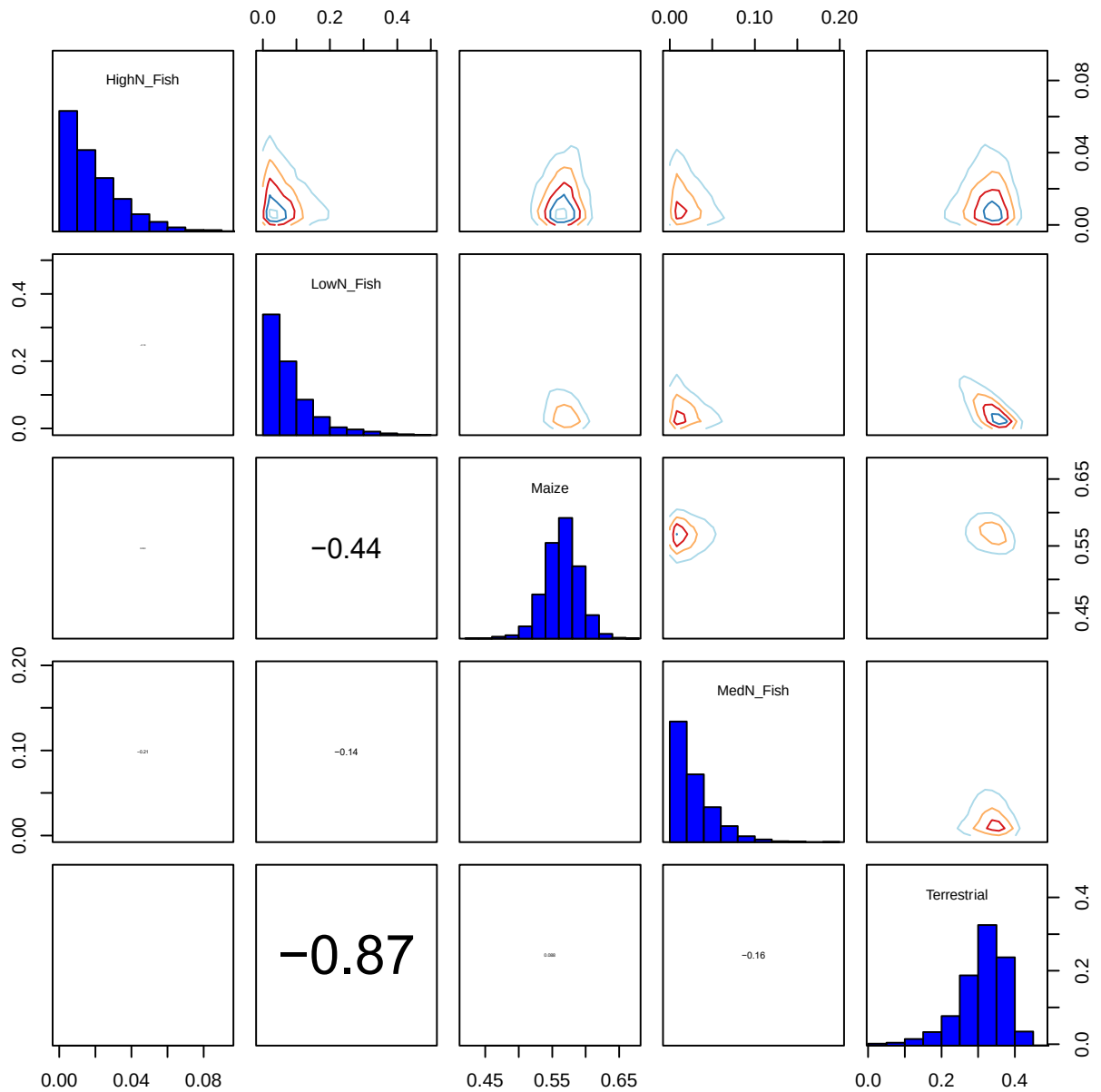
15th Century Dog Model 1 Diagnostics (n=19)

Gelman Diagnostic (variables=25)

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0	0	0

Geweke diagnostic (variables=26)

Chain 1	Chain 2	Chain 3
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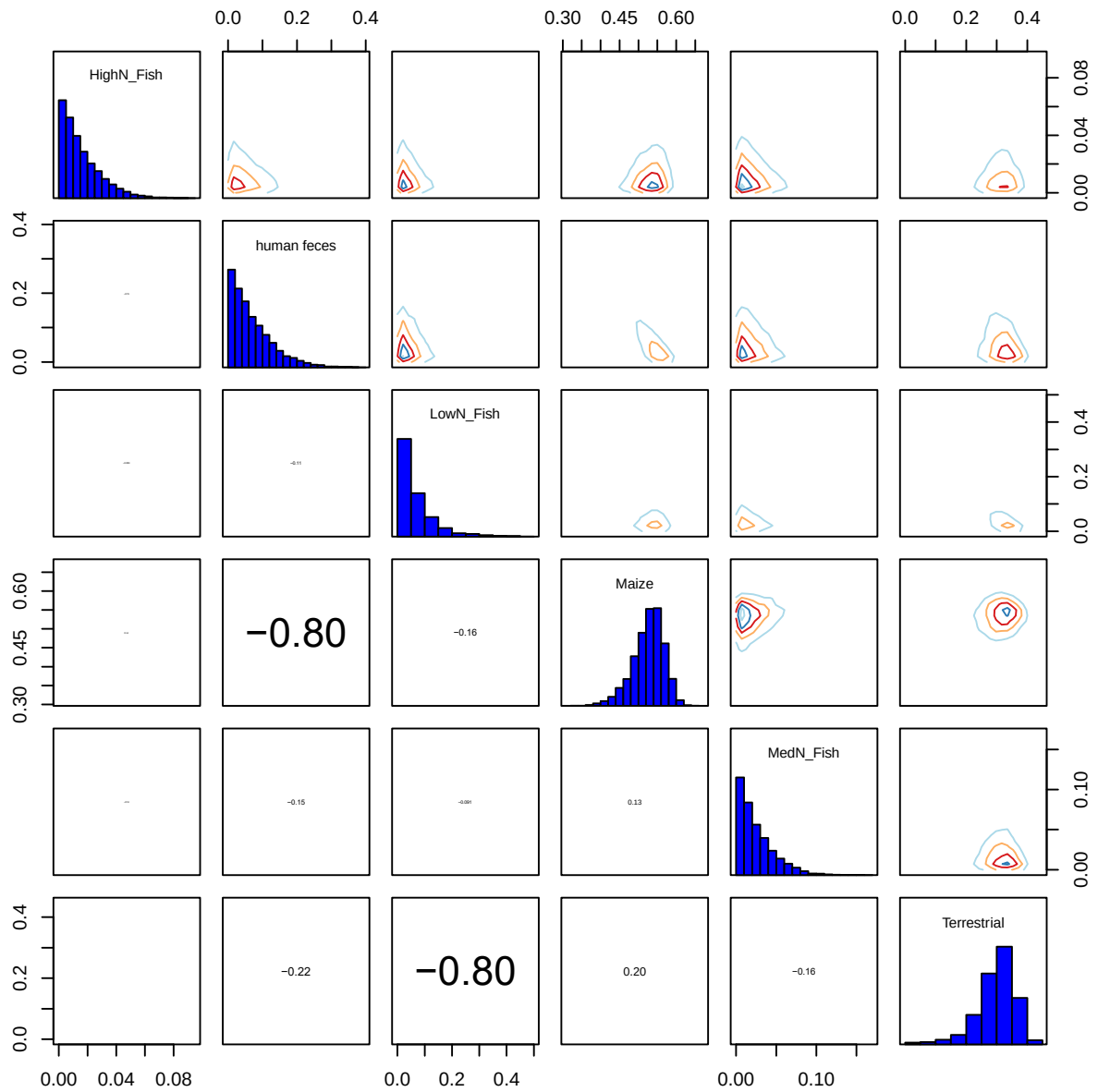
15th Century Dog Model 2 Diagnostics (n=19)

Gelman Diagnostic (variables=26)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=26)

Chain 1	Chain 2	Chain 3
0	1	0



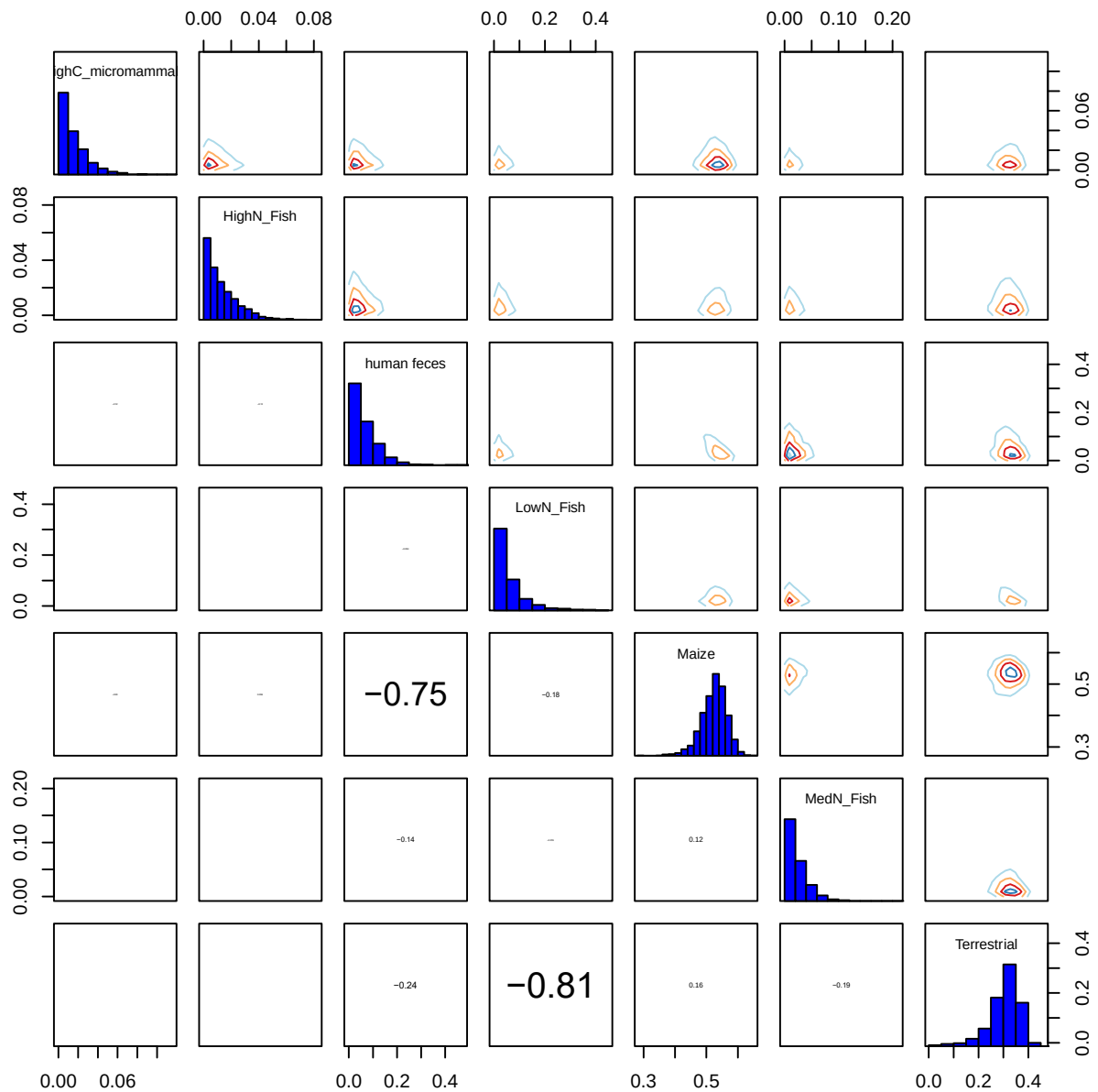
15th Century Dog Model 3 Diagnostics (n=19)

Gelman Diagnostic (variables=27)

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0	0	0

Geweke diagnostic (variables=28)

Chain 1	Chain 2	Chain 3
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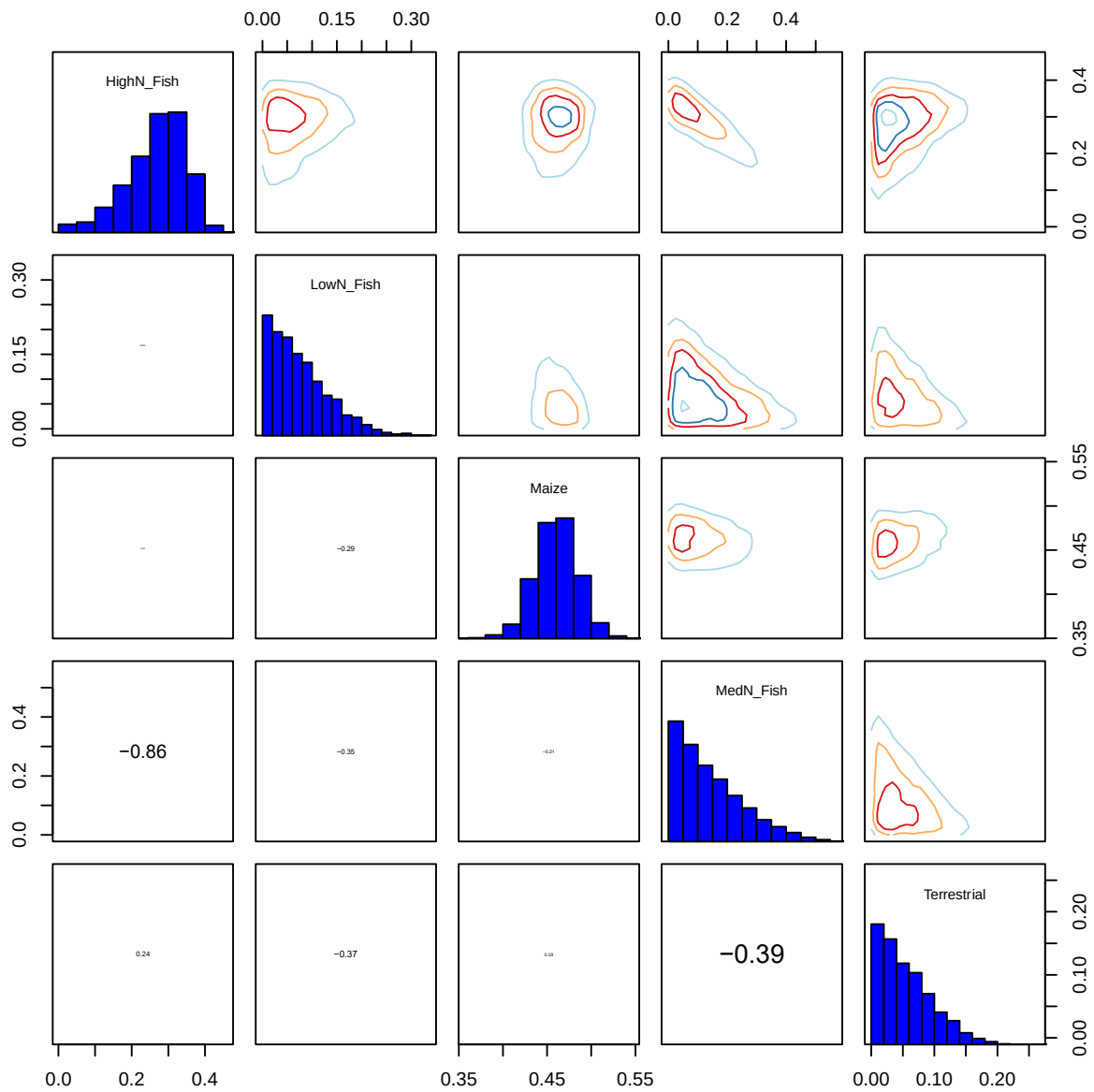
16th Century Human Model Diagnostics (n=20)

Gelman Diagnostic (variables=26)

>1.01	>1.05	>1.10
1	0	0

Geweke diagnostic (variables=26)

Chain 1	Chain 2	Chain 3
0	0	0



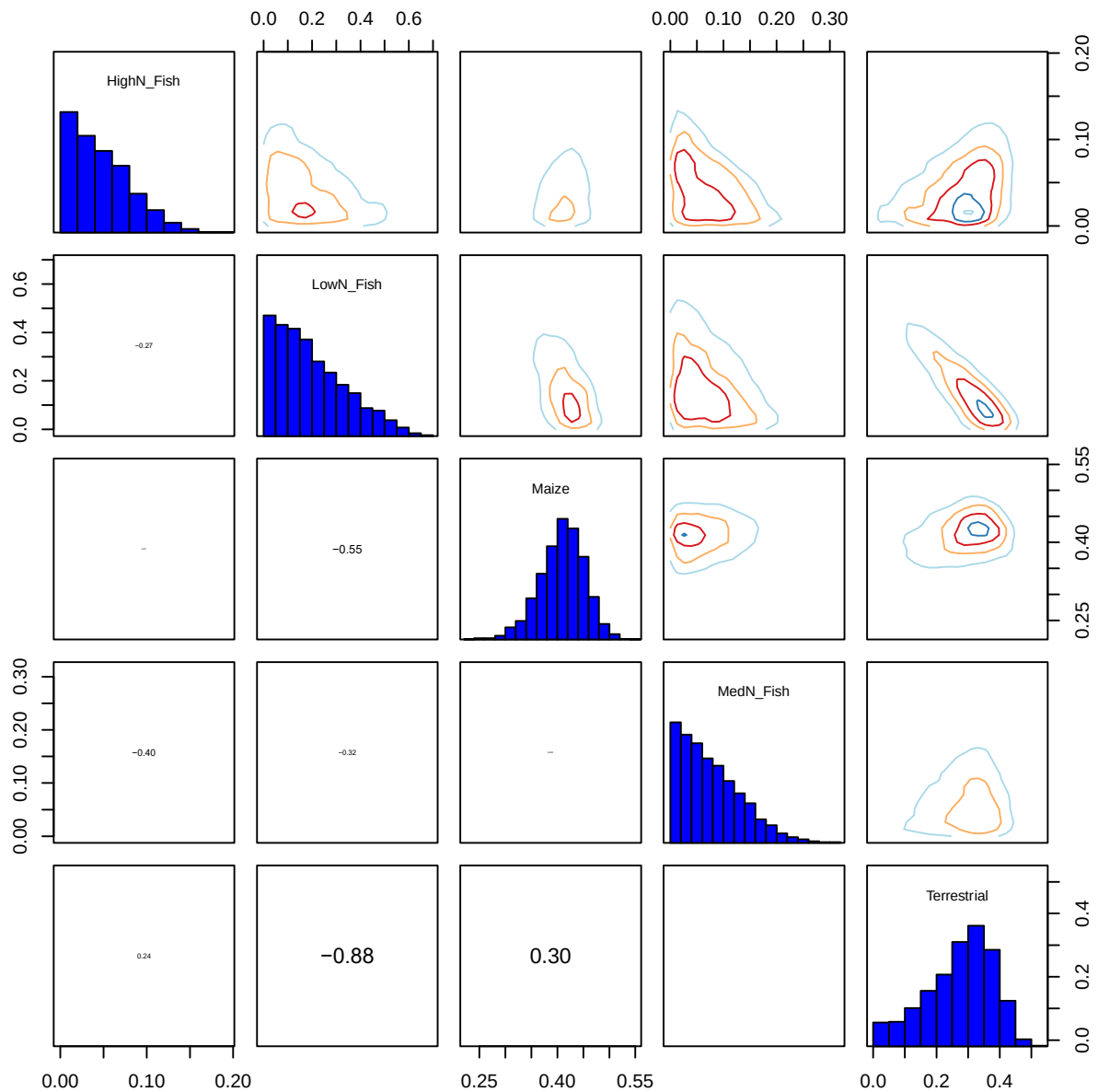
16th Century Dog Model 1 Diagnostics (n=21)

Gelman Diagnostic (variables=27)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=27)

Chain 1	Chain 2	Chain 3
0	0	0



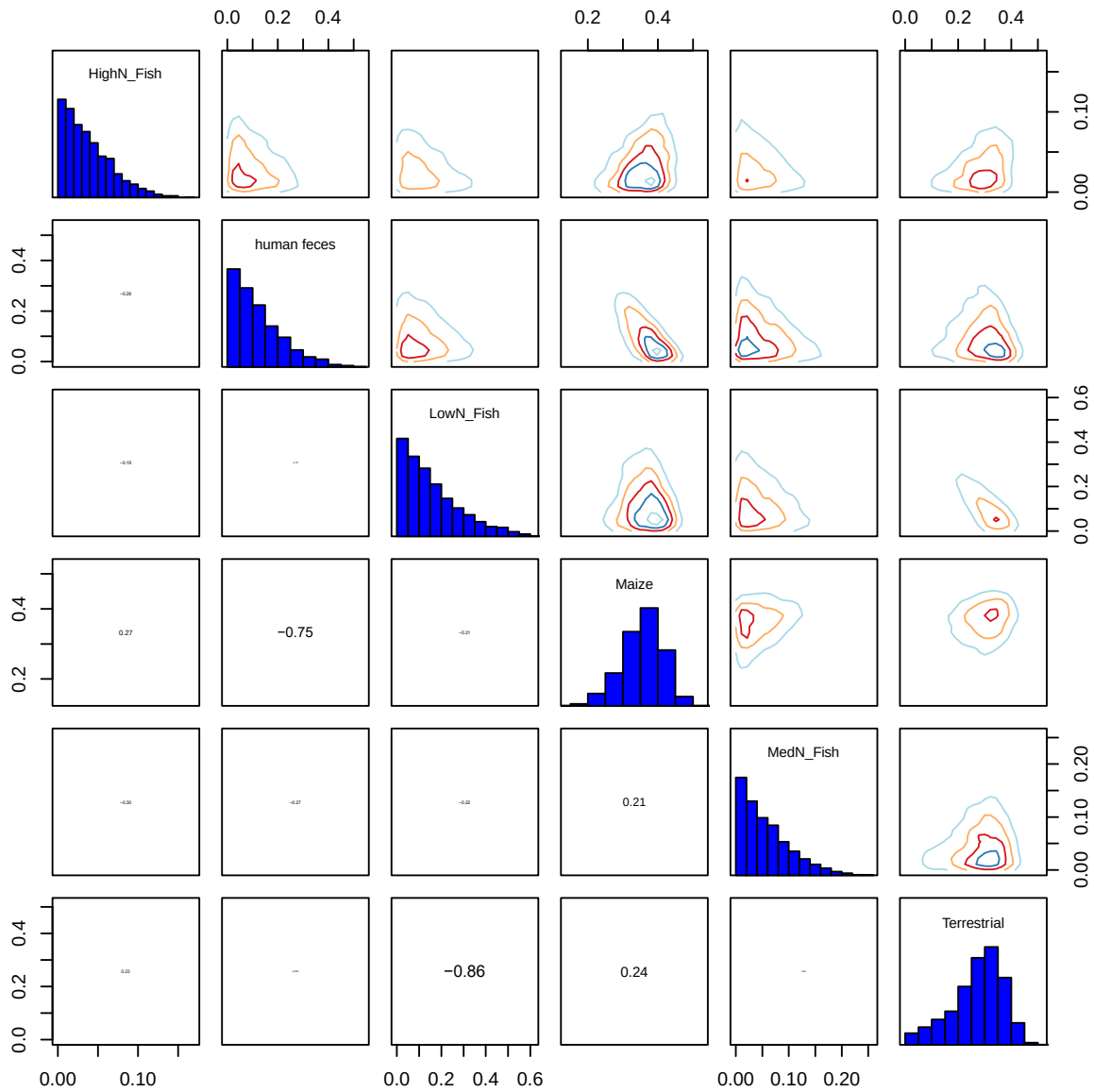
16th Century Dog Model 2 Diagnostics (n=21)

Gelman Diagnostic (variables=28)

>1.01	>1.05	>1.10
1	0	0

Geweke diagnostic (variables=28)

Chain 1	Chain 2	Chain 3
1	1	1



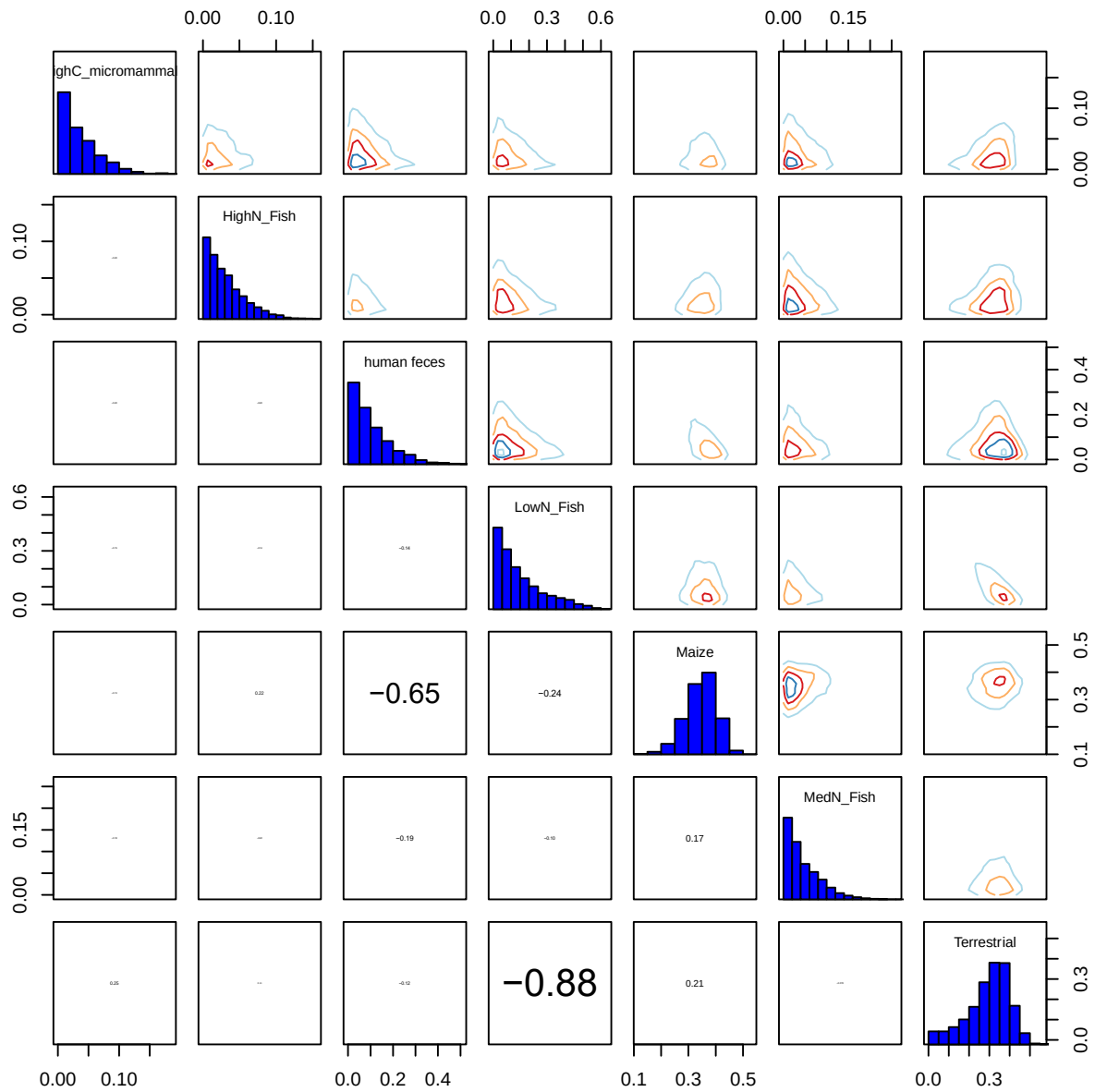
16th Century Dog Model 3 Diagnostics (n=21)

Gelman Diagnostic (variables=29)

>1.01	>1.05	>1.10
3	0	0

Geweke diagnostic (variables=29)

Chain 1	Chain 2	Chain 3
0	0	0



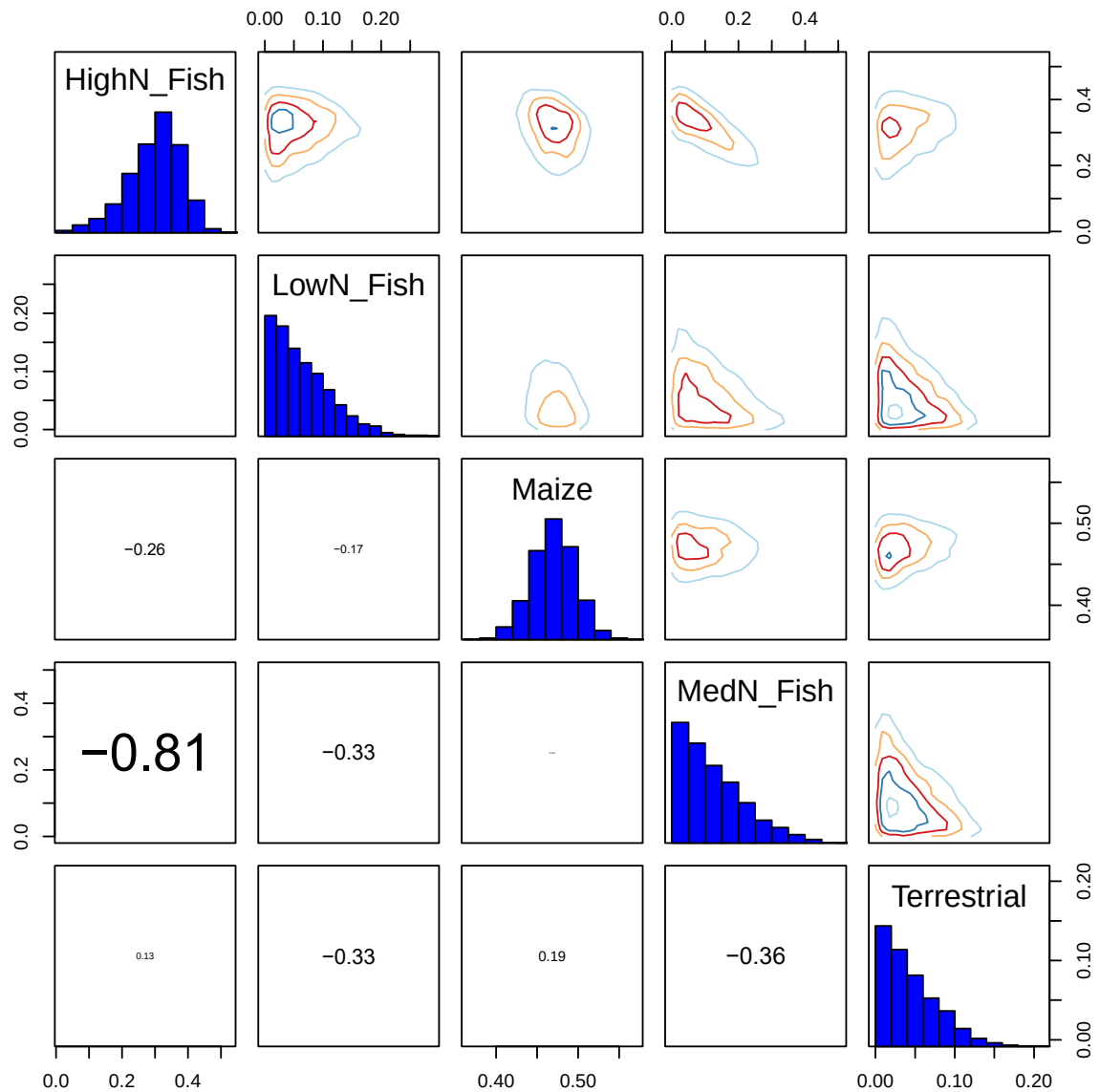
17th Century Human Model Diagnostics (n=16)

Gelman Diagnostic (variables=22)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=22)

Chain 1	Chain 2	Chain 3
1	0	0



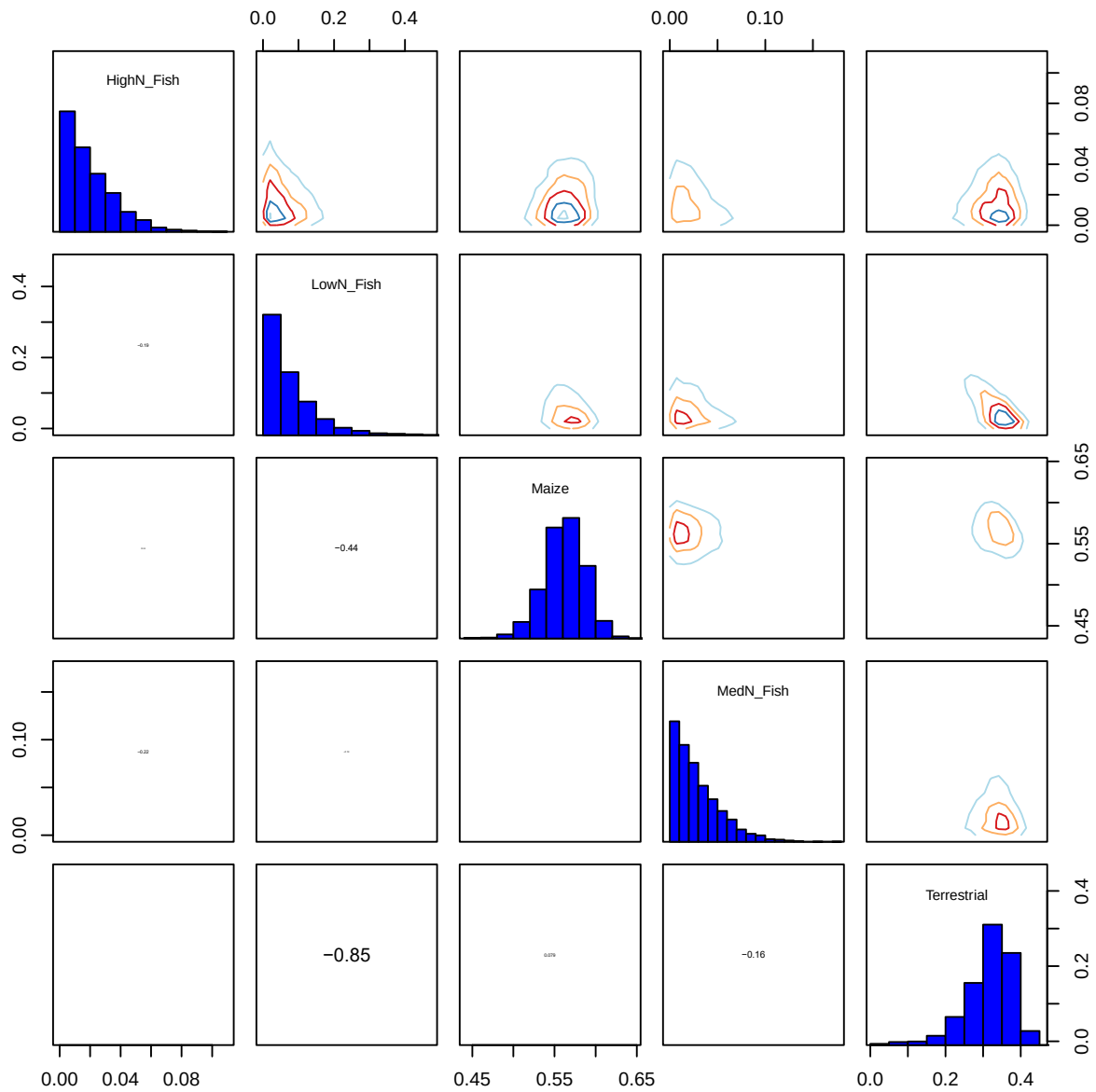
17th Century Dog Model 1 Diagnostics (n=41)

Gelman Diagnostic (variables=47)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=47)

Chain 1	Chain 2	Chain 3
2	0	1



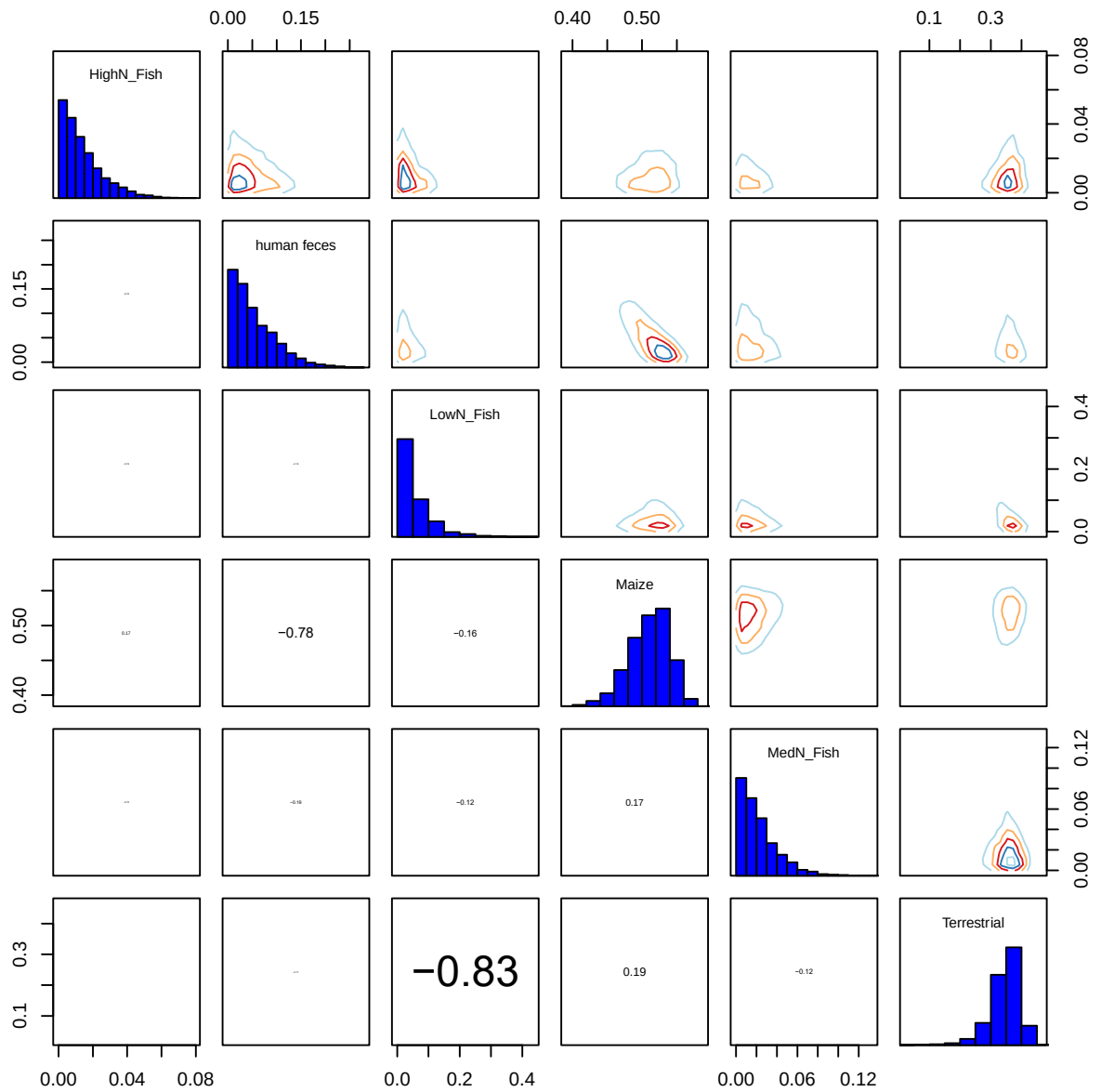
17th Century Dog Model 2 Diagnostics (n=41)

Gelman Diagnostic (variables=48)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=48)

Chain 1	Chain 2	Chain 3
0	0	2



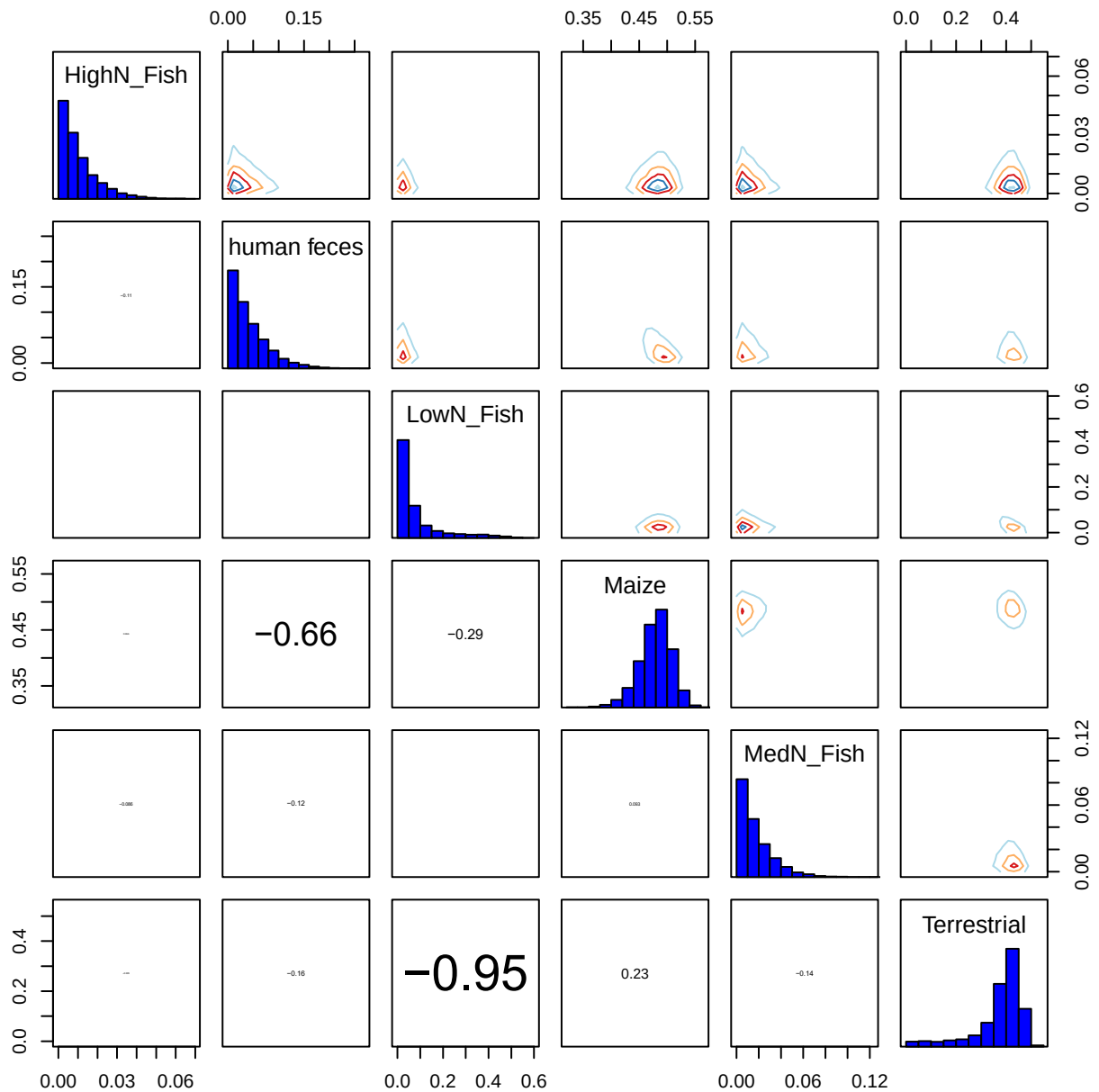
17th Century Dog Model 3 Diagnostics (n=41)

Gelman Diagnostic (variables=49)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=49)

Chain 1	Chain 2	Chain 3
1	0	1



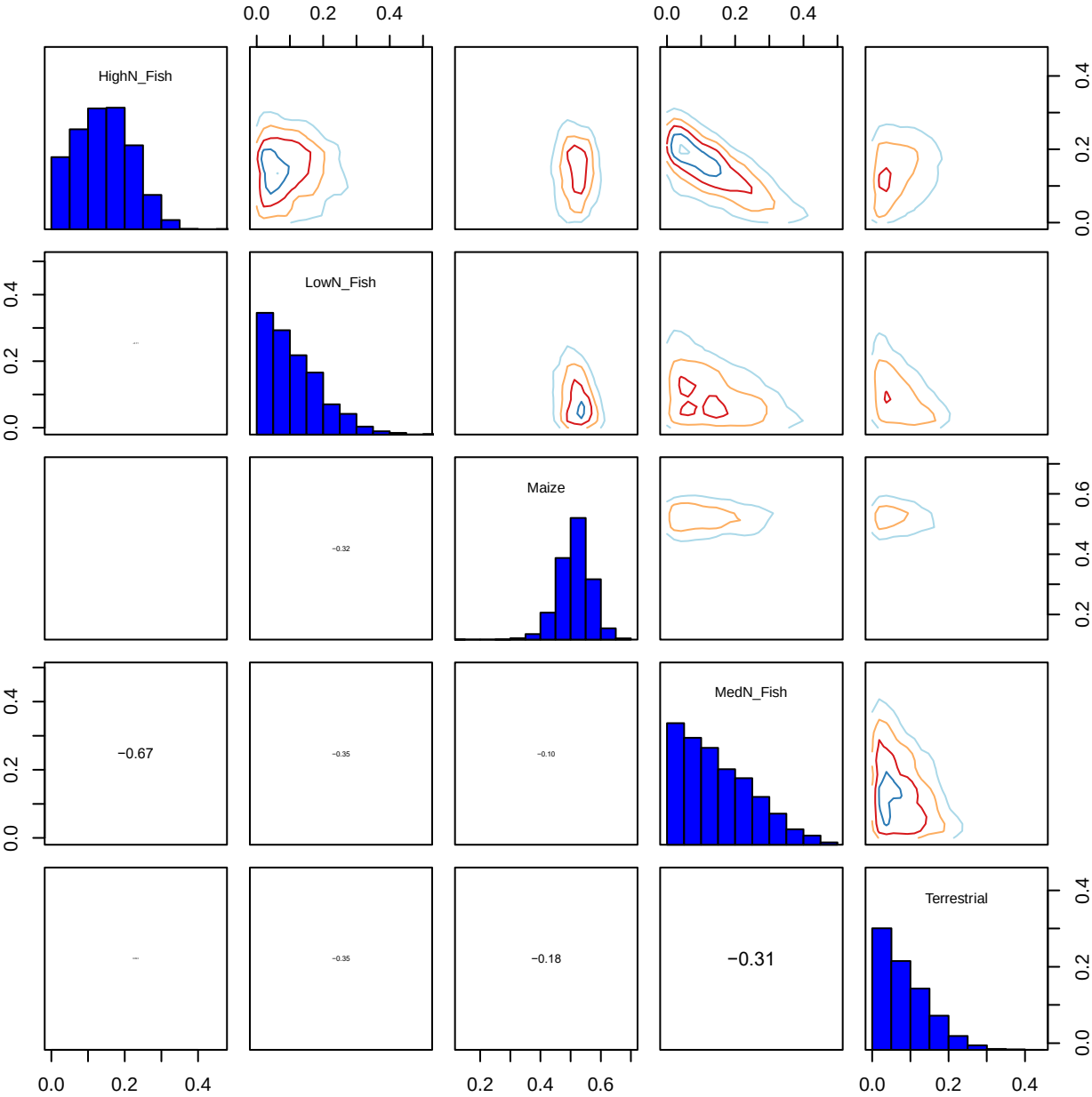
Fairty Ossuary Human Model Diagnostics (n=8)

Gelman Diagnostic (variables=14)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=14)

Chain 1	Chain 2	Chain 3
1	0	0



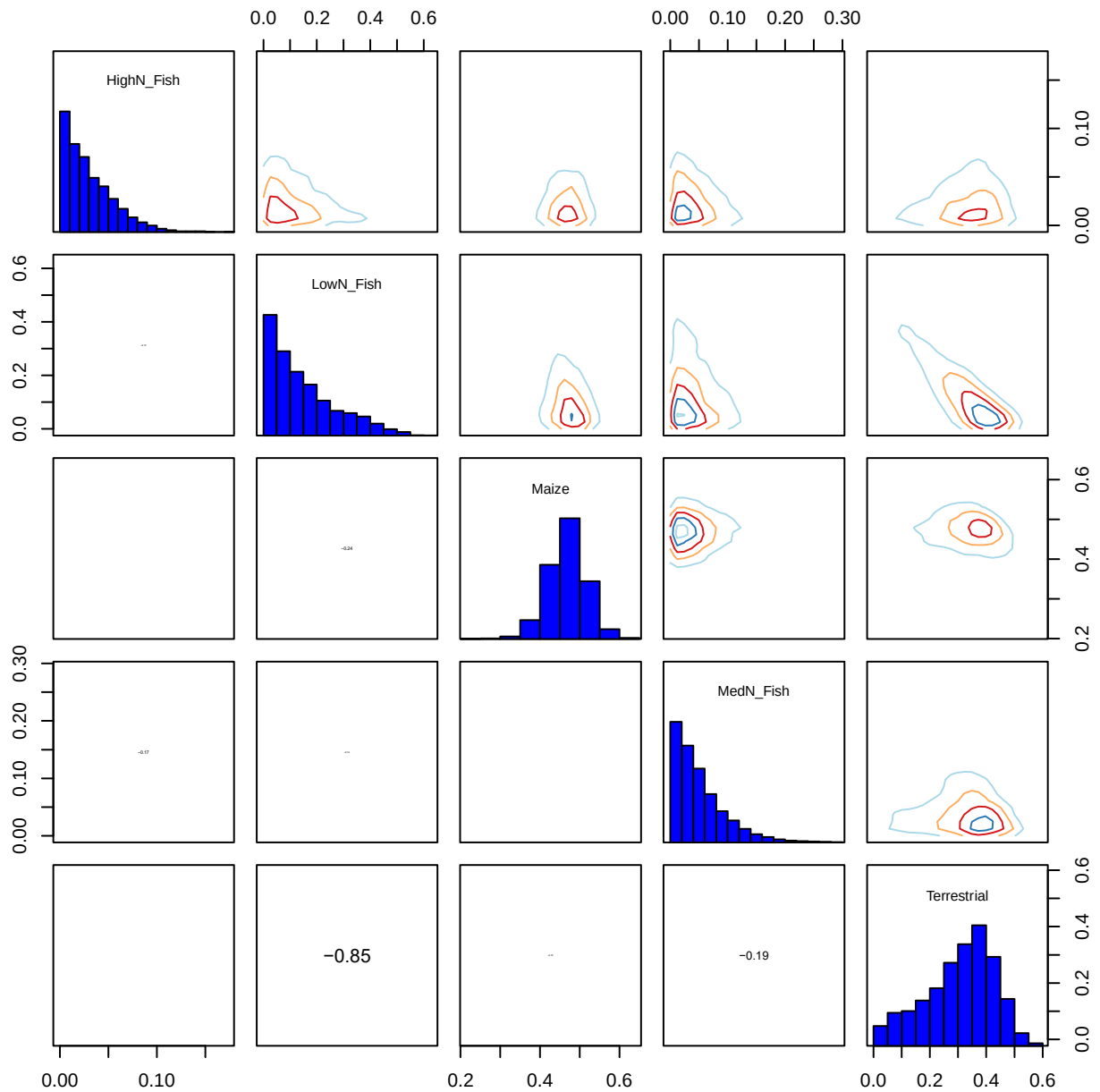
Robb Village Dog Model 1 Diagnostics (n=9)

Gelman Diagnostic (variables=14)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=14)

Chain 1	Chain 2	Chain 3
0	0	0



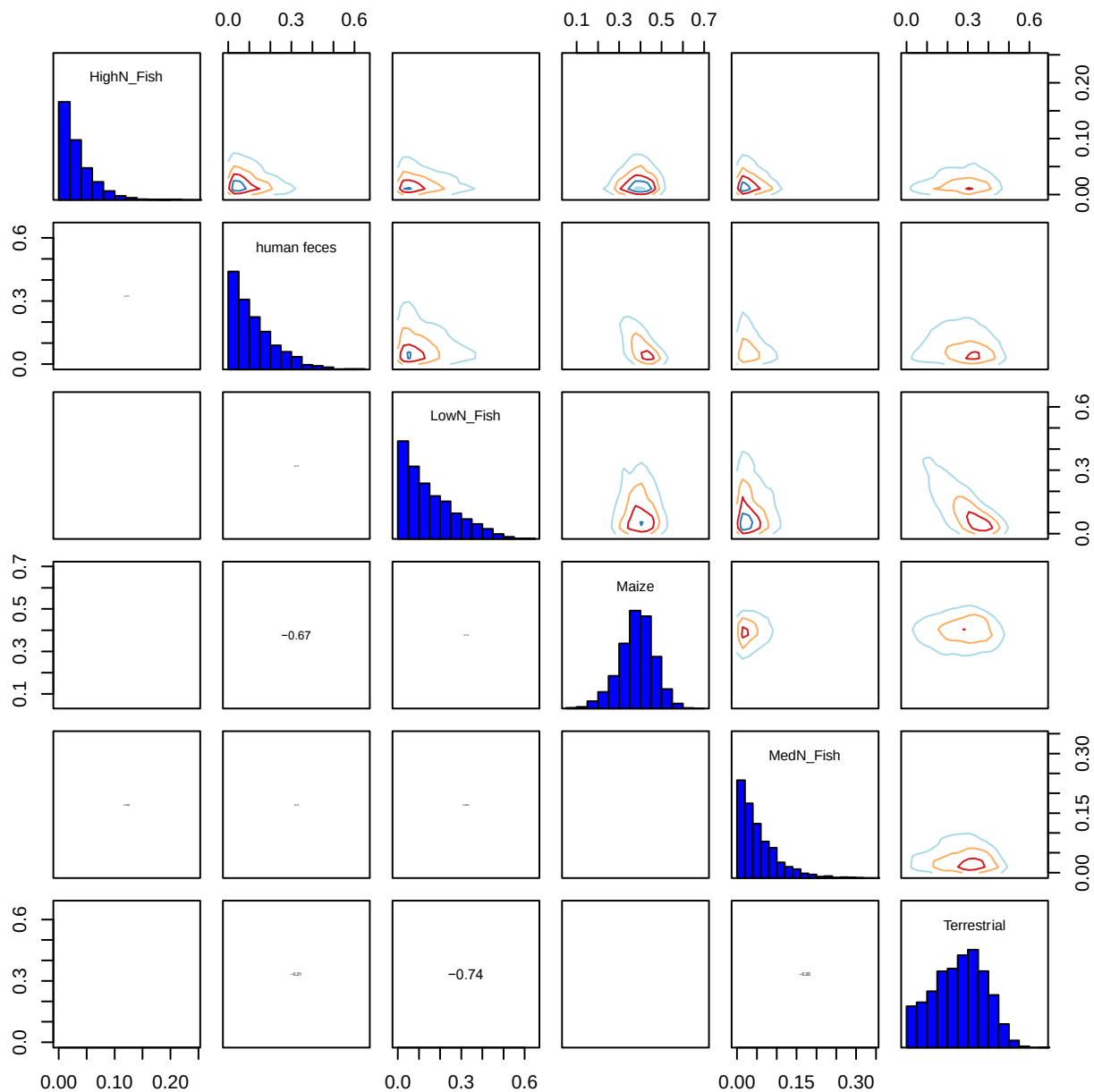
Robb Village Dog Model 2 Diagnostic (n=9)

Gelman Diagnostic (variables=16)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=19)

Chain 1	Chain 2	Chain 3
0	0	0



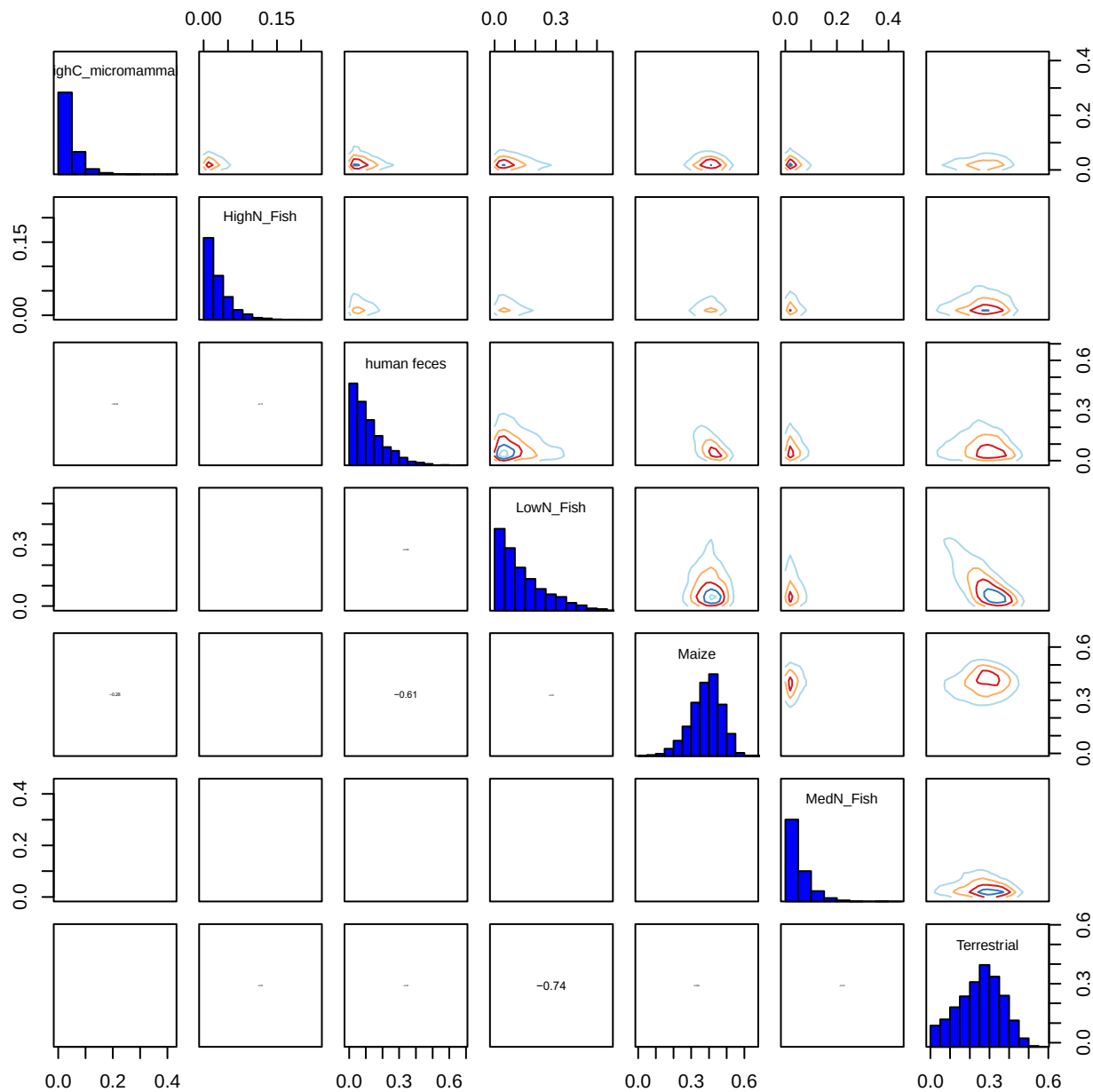
Robb Village Dog Model 3 Diagnostics (n=9)

Gelman Diagnostic (variables=17)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=17)

Chain 1	Chain 2	Chain 3
0	0	0



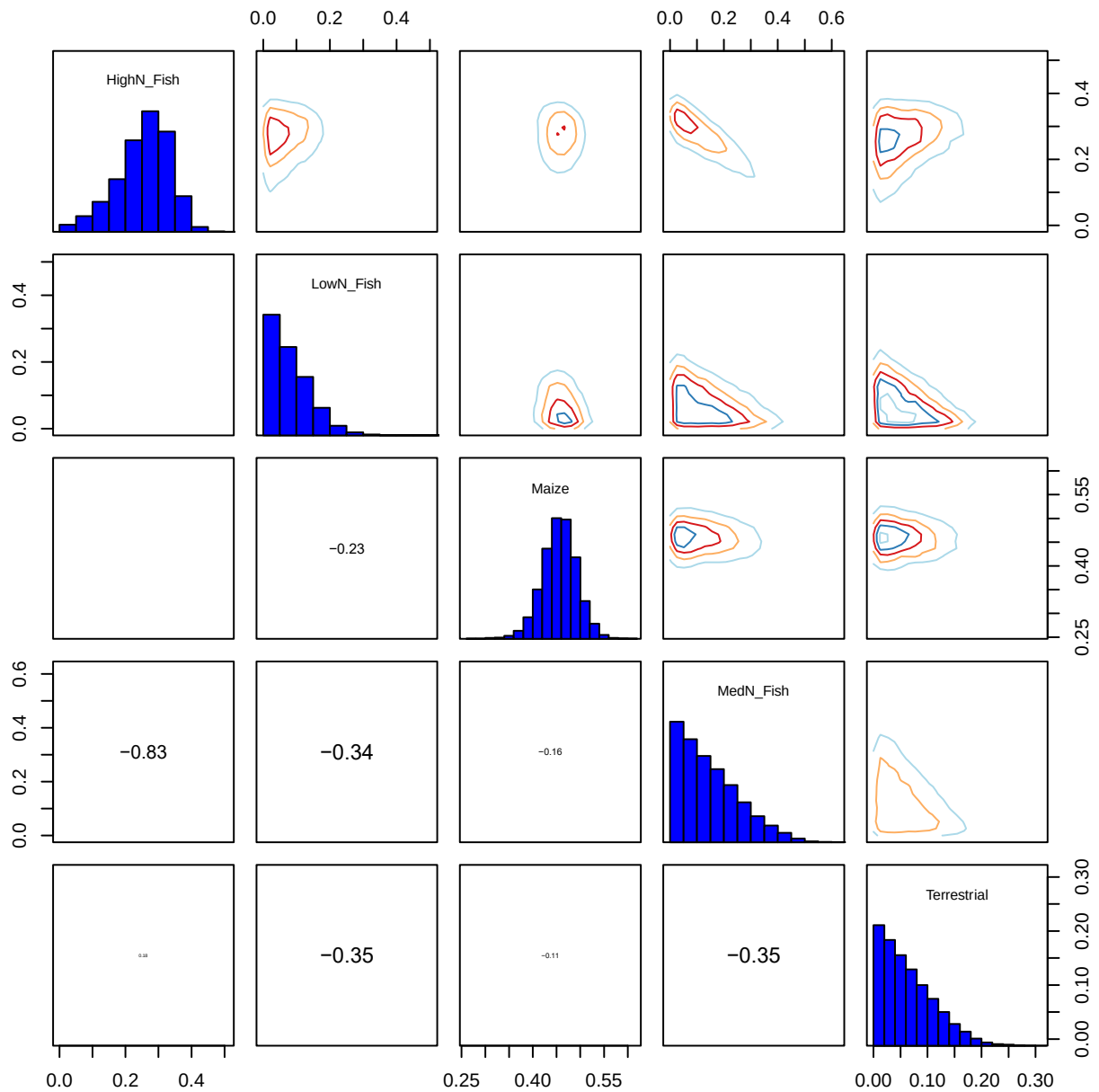
Kleinberg Ossuary Human Model Diagnostics (n=12)

Gelman Diagnostic (variables=17)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=17)

Chain 1	Chain 2	Chain 3
0	0	0



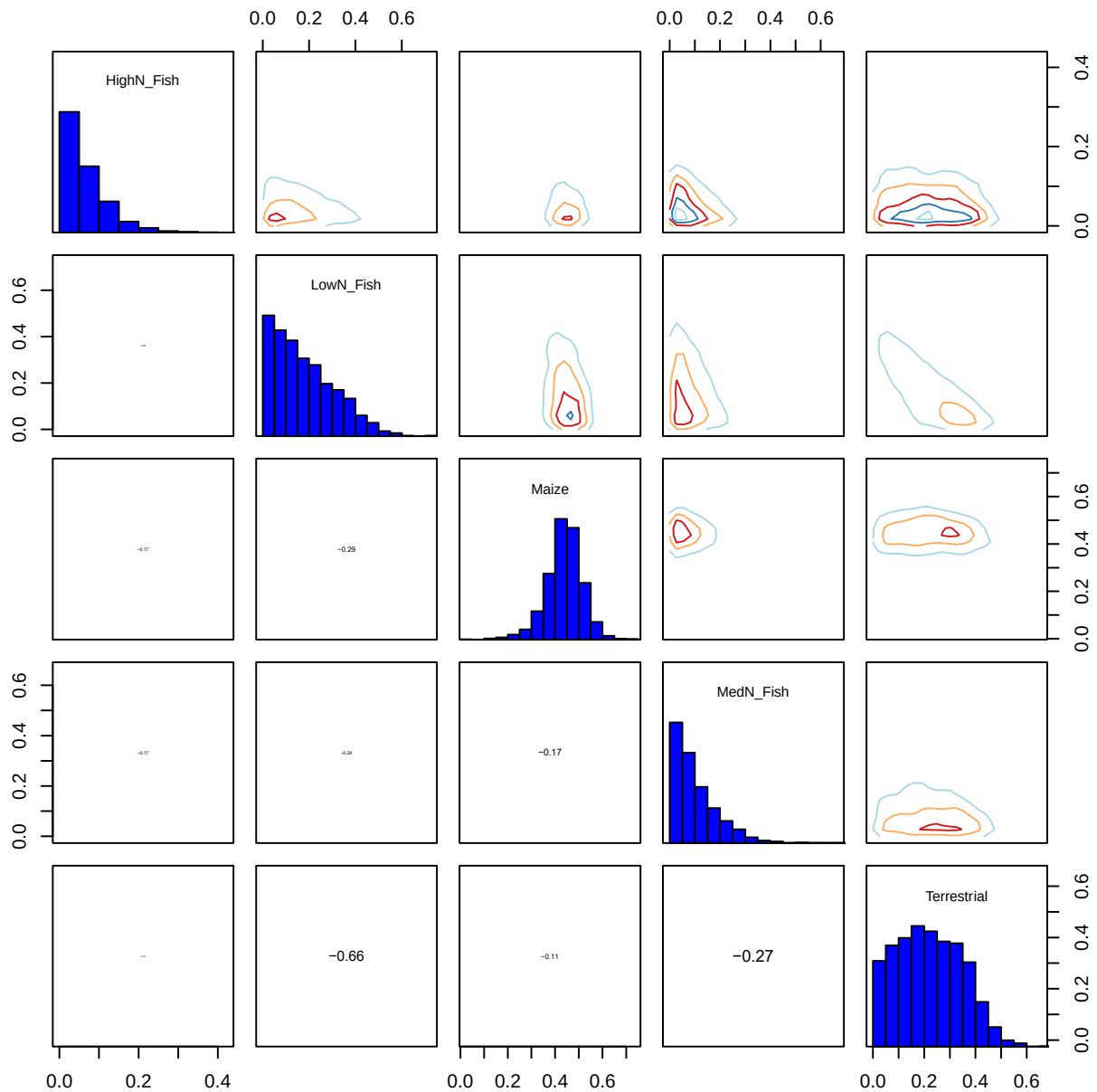
Seed-Barker Village Dog Model 1 Diagnostics (n=5)

Gelman Diagnostic (variables=11)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=11)

Chain 1	Chain 2	Chain 3
0	0	0



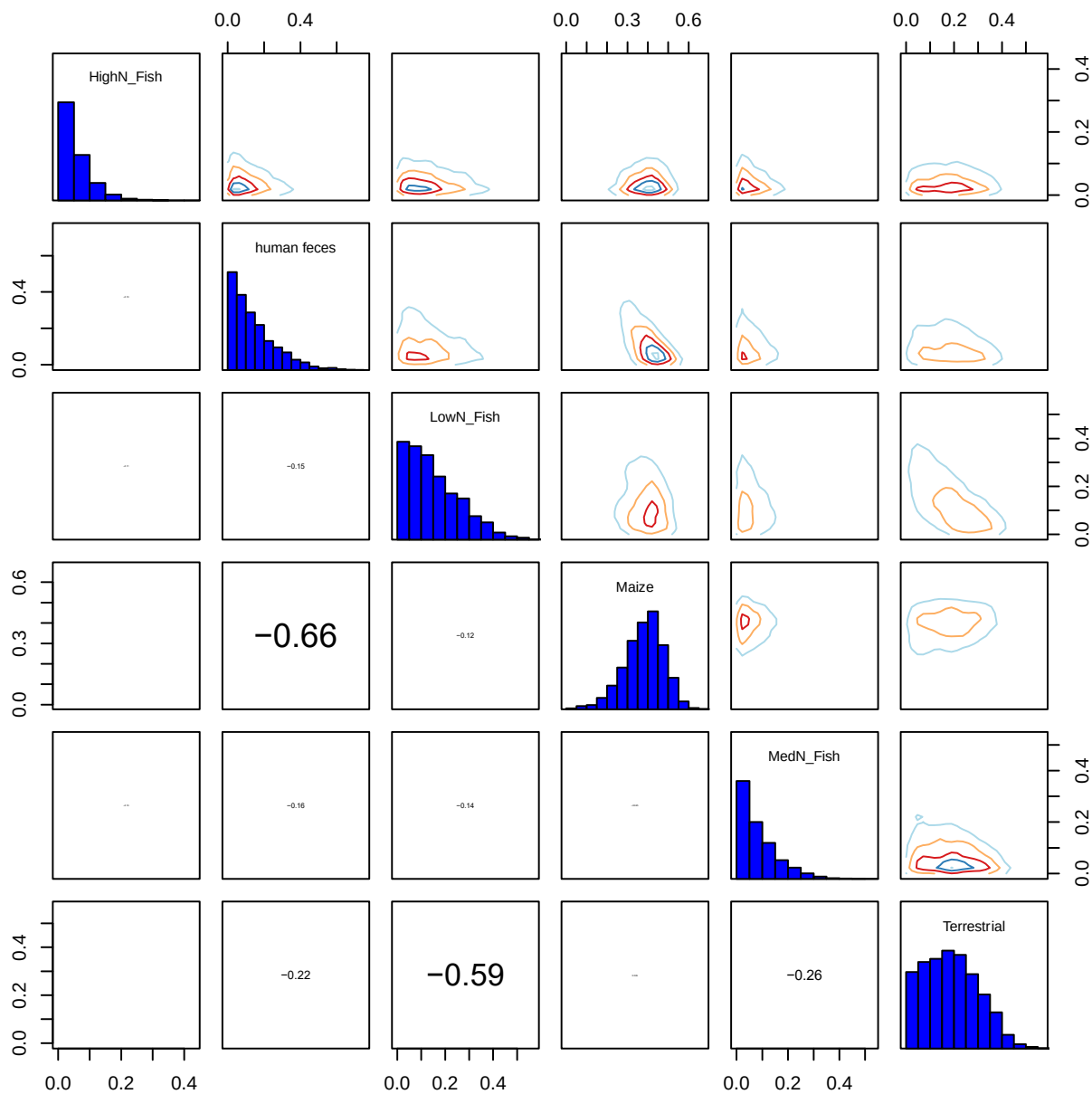
Seed-Barker Village Dog Model 2 Diagnostics (n=5)

Gelman Diagnostic (variables=12)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=12)

Chain 1	Chain 2	Chain 3
0	0	0



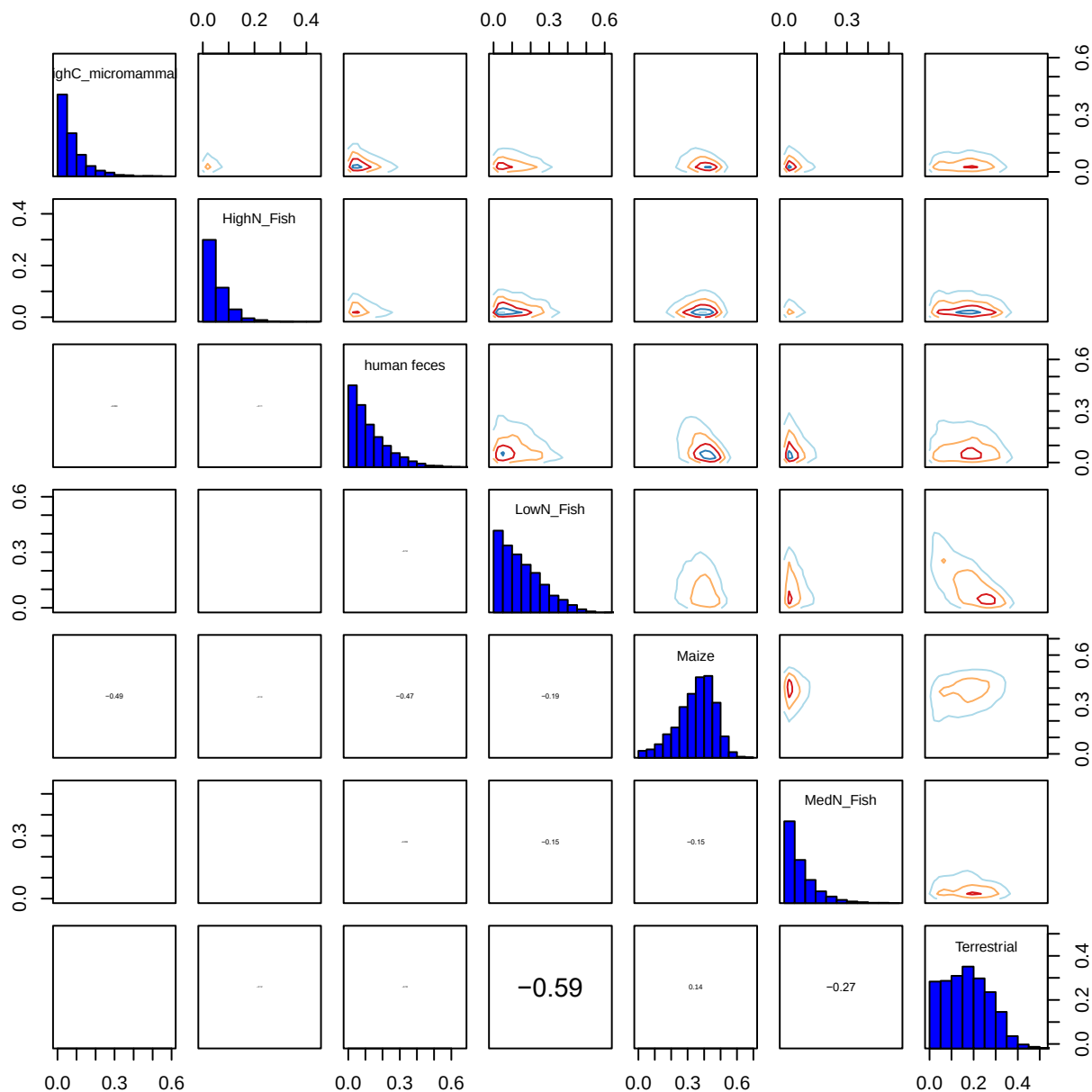
Seed-Barker Village Dog Model 3 Diagnostics (n=5)

Gelman Diagnostic (variables=13)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=13)

Chain 1	Chain 2	Chain 3
0	0	0



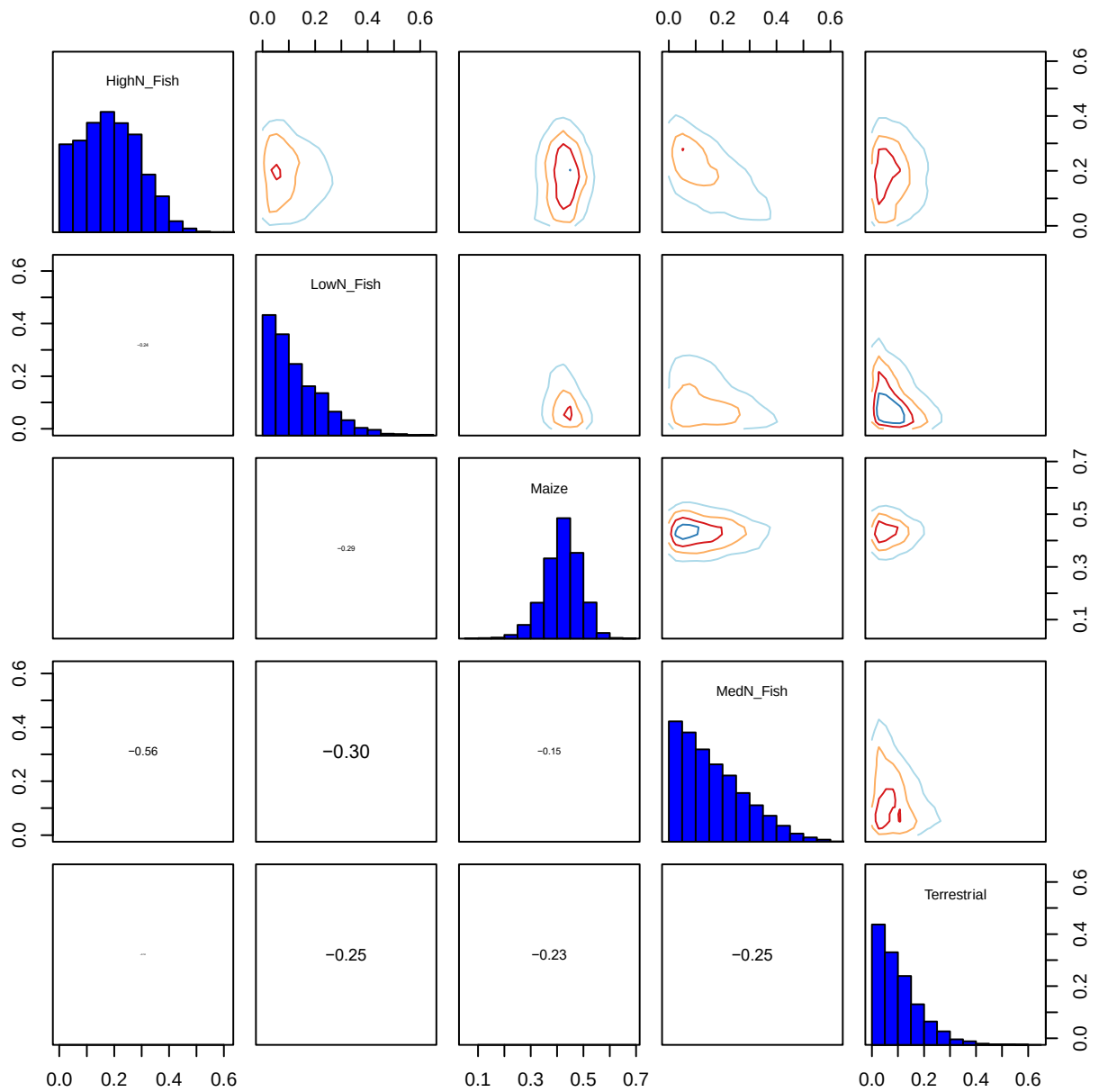
Ball Village Human Model Disgnostics (n=6)

Gelman Diagnostic (variables=12)

>1.01	>1.05	>1.10
1	0	0

Geweke diagnostic (variables=12)

Chain 1	Chain 2	Chain 3
0	0	0



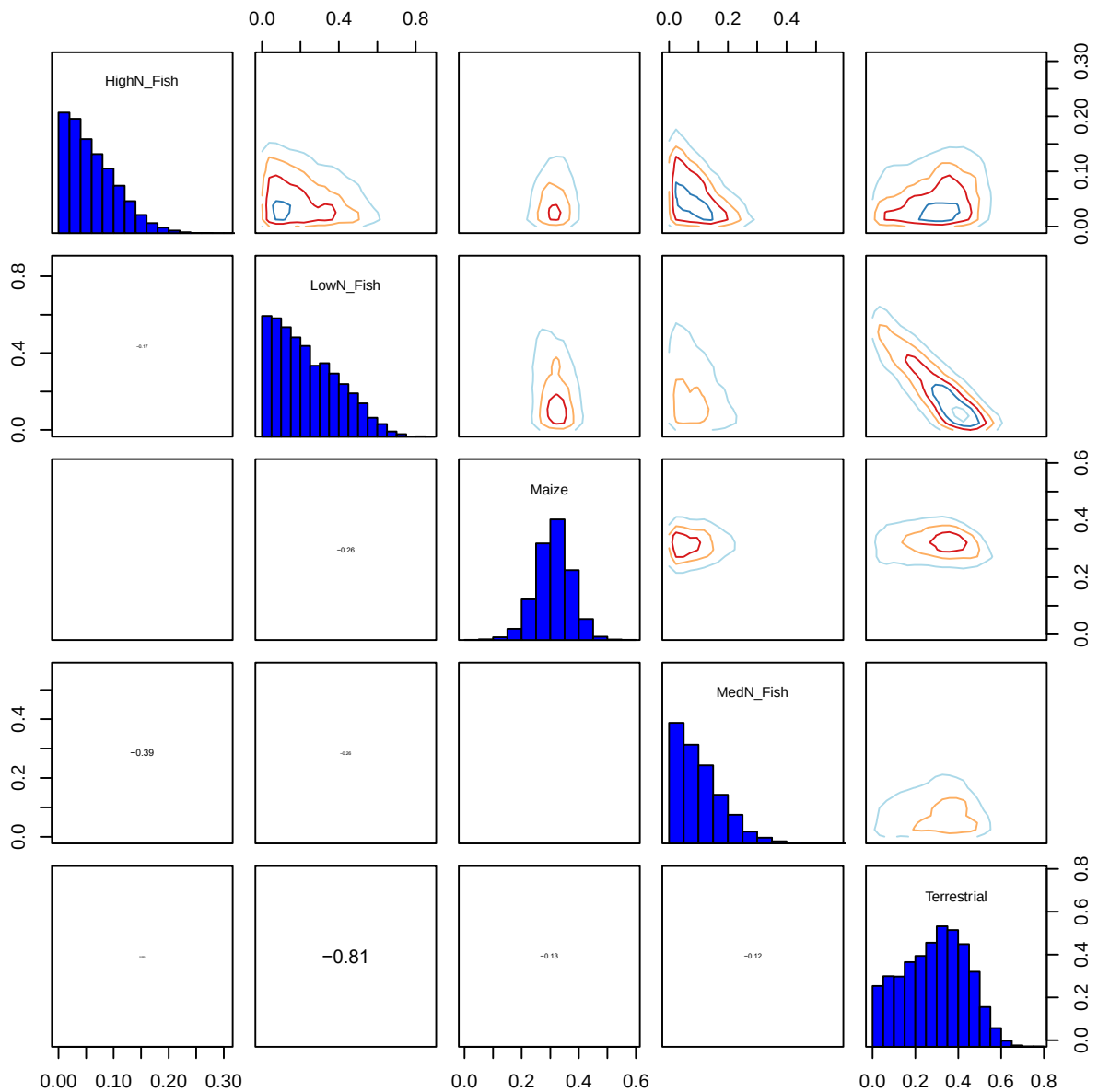
Ball Village Dog Model 1 Disgnostics (n=12)

Gelman Diagnostic (variables=18)

>1.01	>1.05	>1.10
1	0	0

Geweke diagnostic (variables=18)

Chain 1	Chain 2	Chain 3
0	1	0



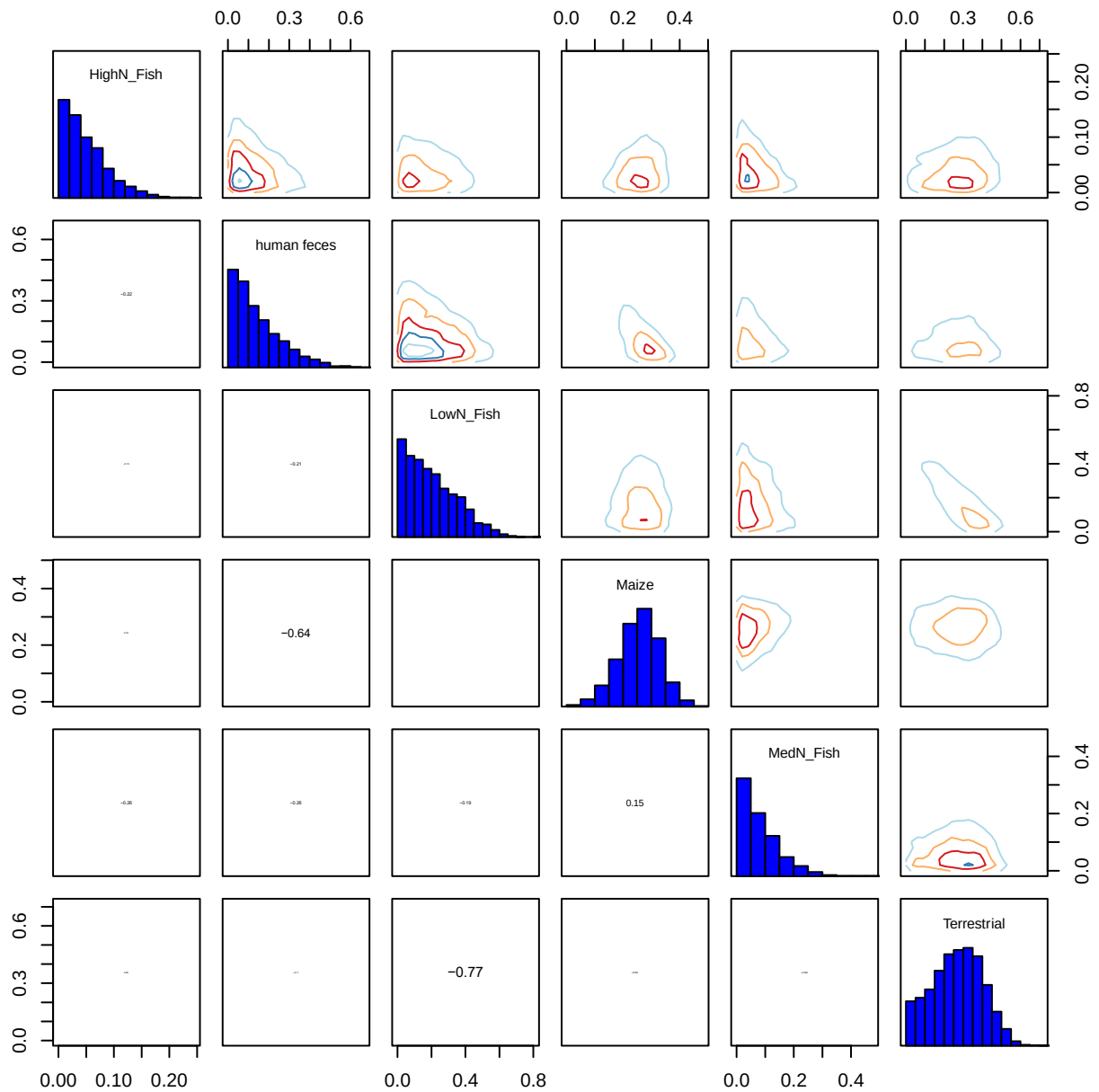
Ball Village Dog Model 2 Diagnostics (n=12)

Gelman Diagnostic (variables=19)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=19)

Chain 1	Chain 2	Chain 3
1	0	0



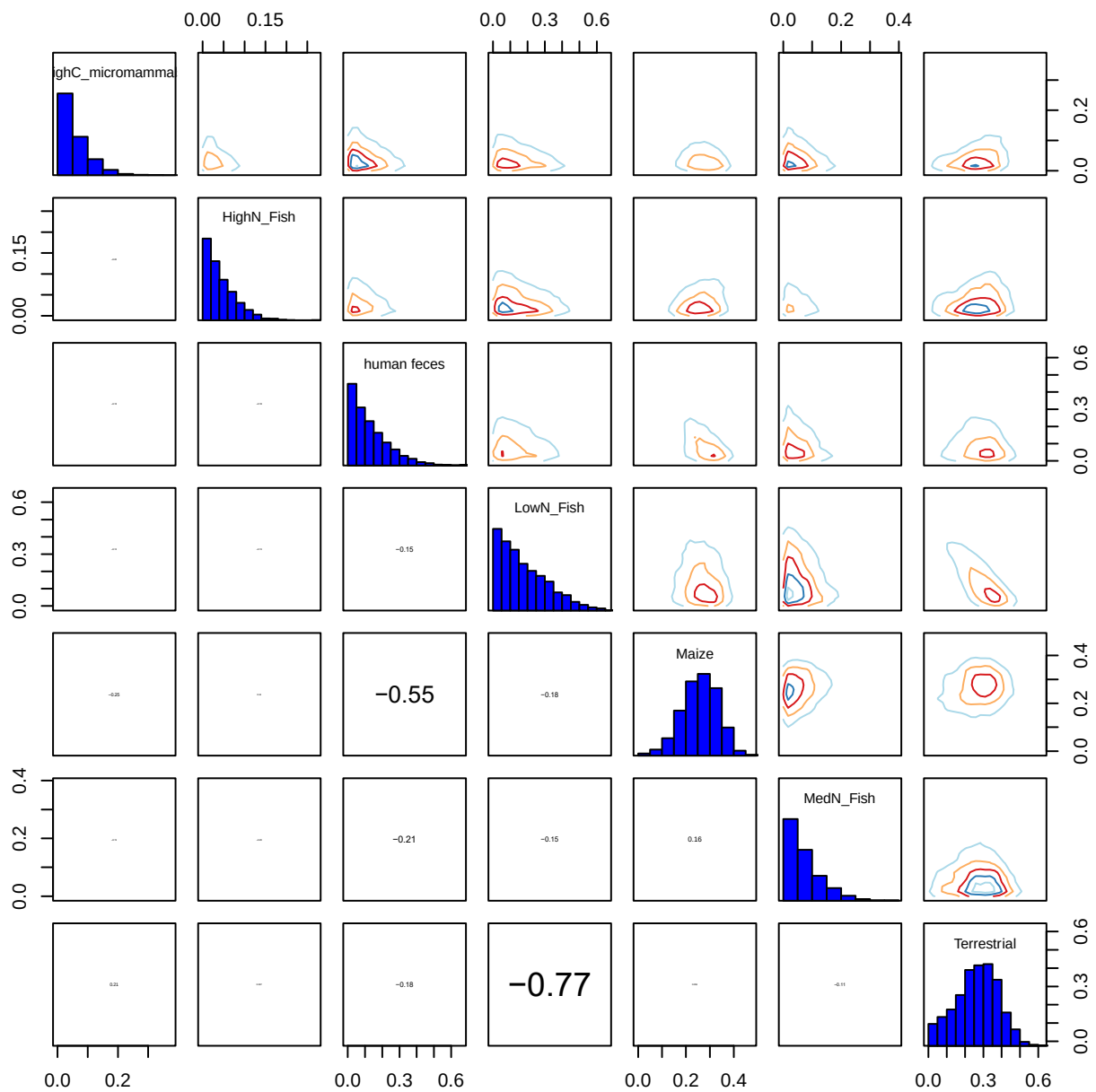
Ball Village Dog Model 3 Diagnostics (n=12)

Gelman Diagnostic (variables=20)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=20)

Chain 1	Chain 2	Chain 3
0	1	0



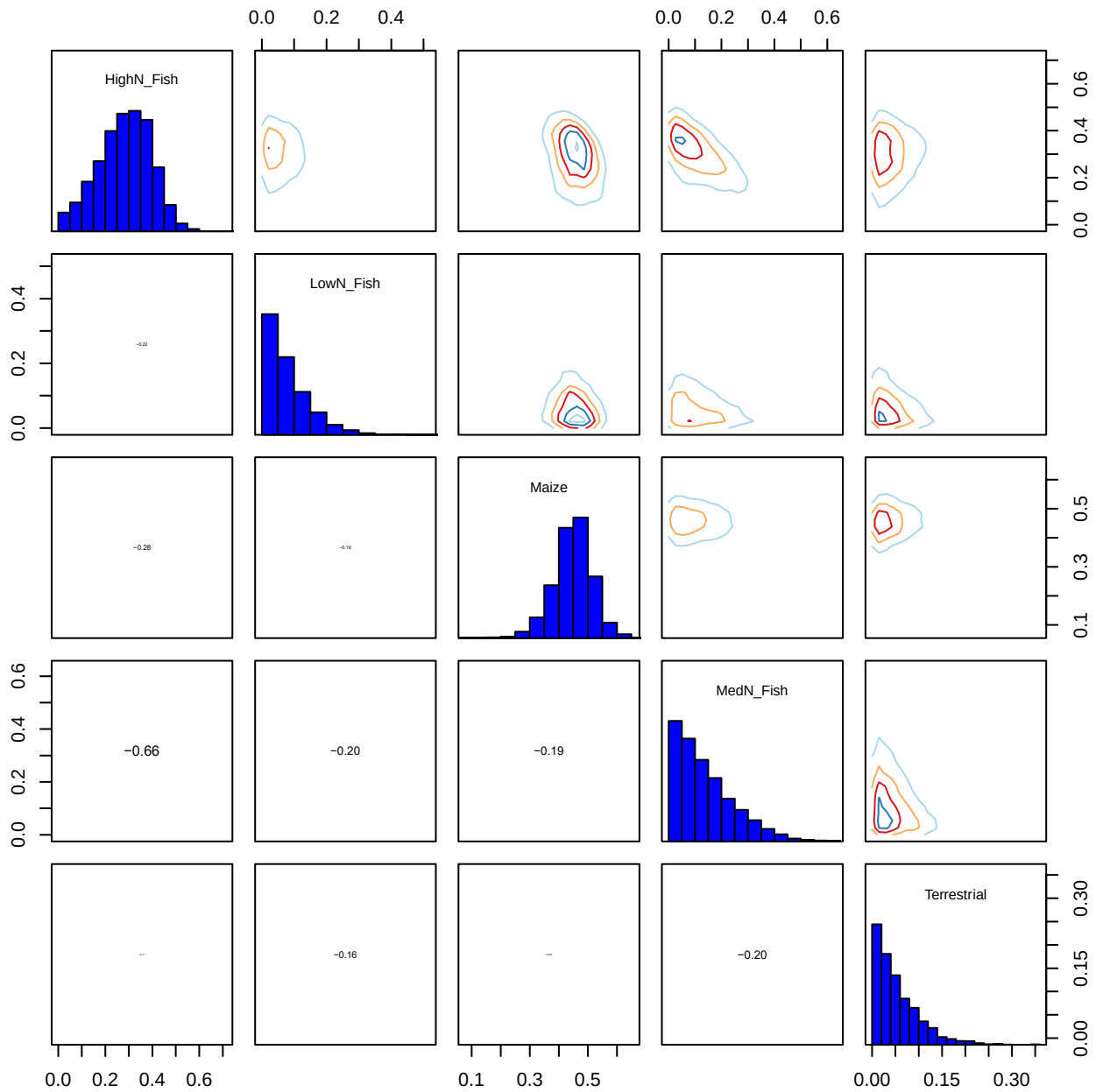
Kelly Campbell Village Human Model Diagnostics (n=6)

Gelman Diagnostic (variables=12)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=12)

Chain 1	Chain 2	Chain 3
0	0	0



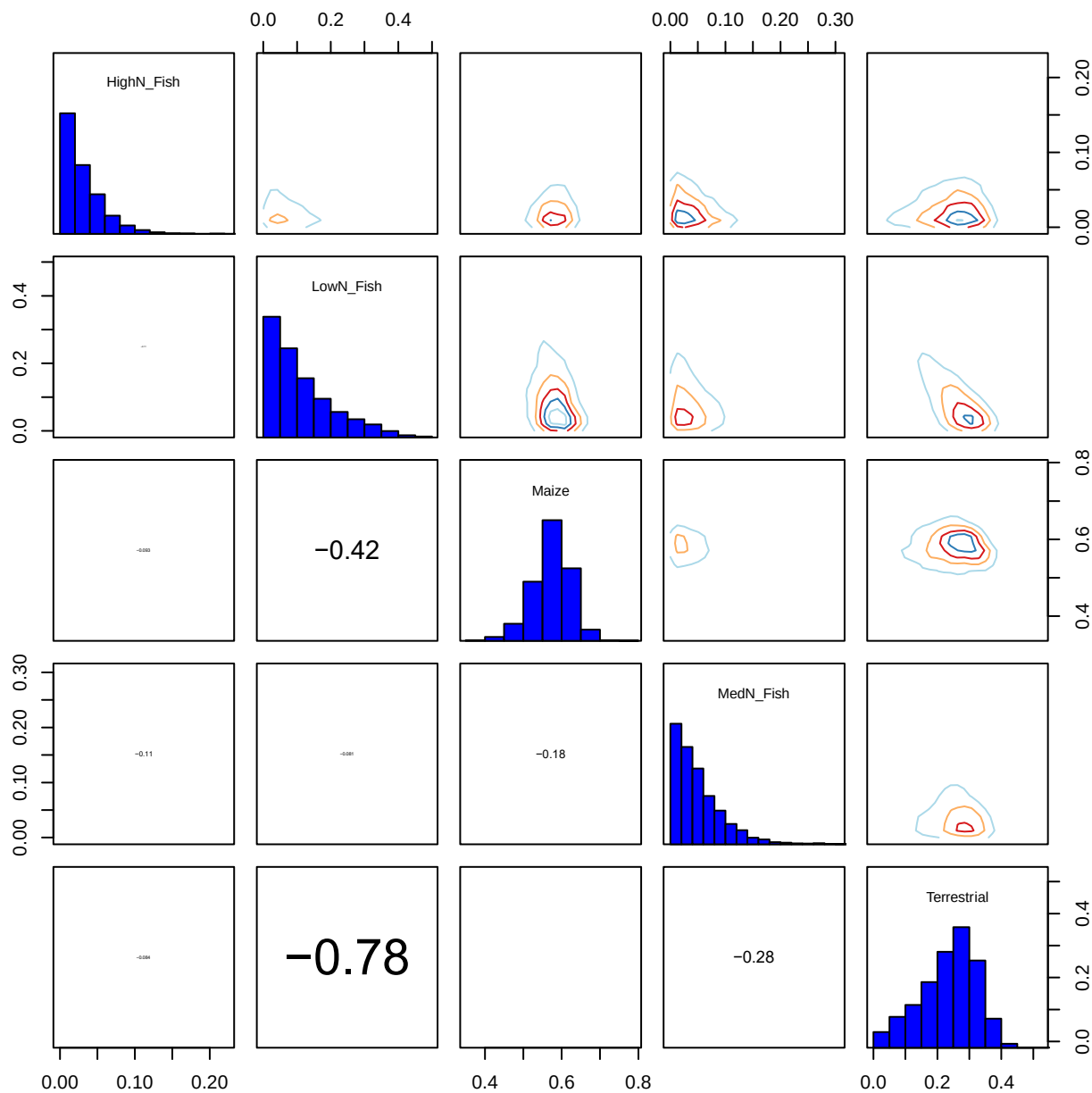
Kelly Campbell Village Dog Model 1 Diagnostics (n=8)

Gelman Diagnostic (variables=14)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=14)

Chain 1	Chain 2	Chain 3
0	0	0



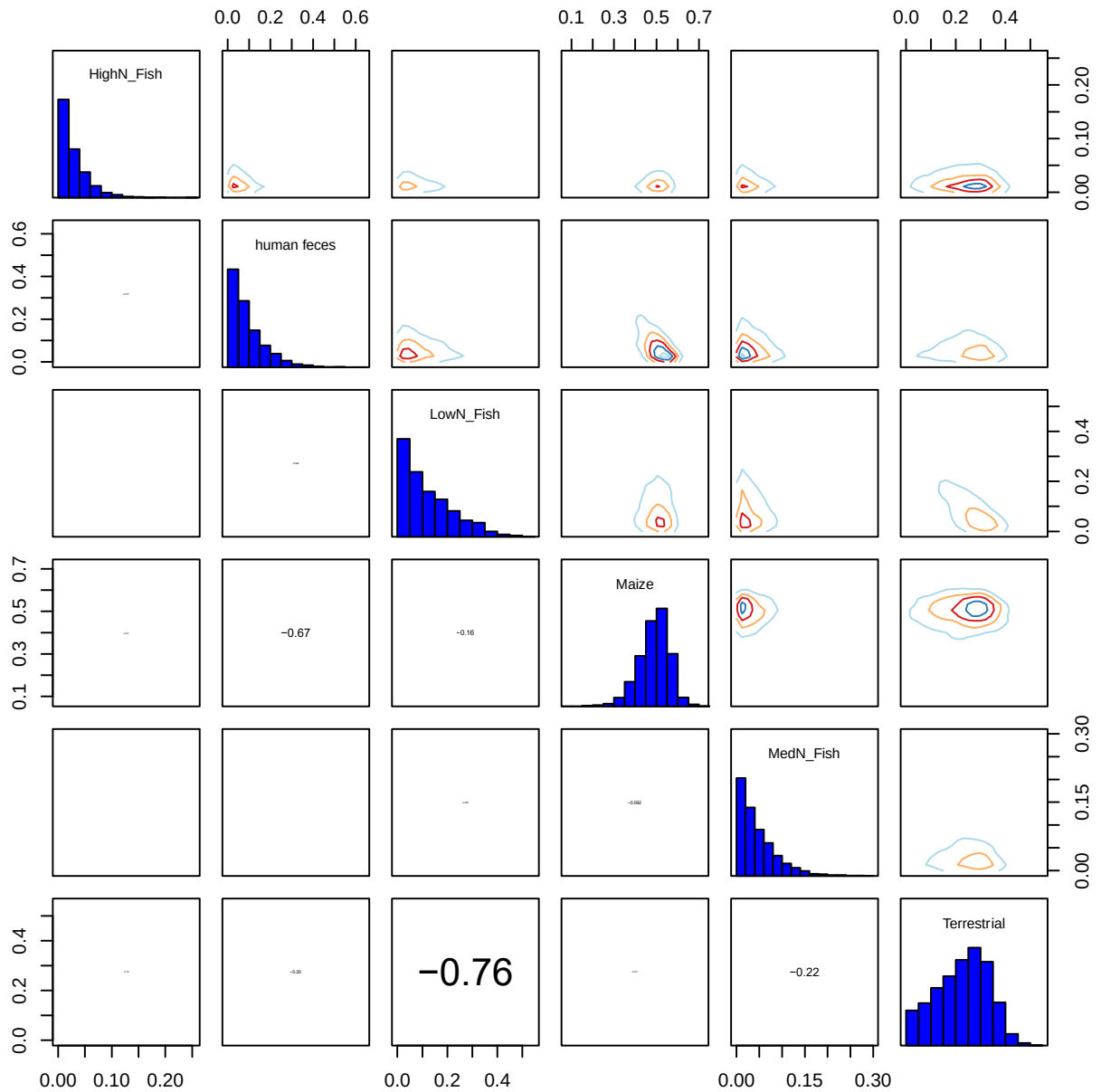
Kelly Campbell Village Dog Model 2 Diagnostics (n=8)

Gelman Diagnostic (variables=15)

>1.01	>1.05	>1.10
1	0	0

Geweke diagnostic (variables=15)

Chain 1	Chain 2	Chain 3
0	0	0



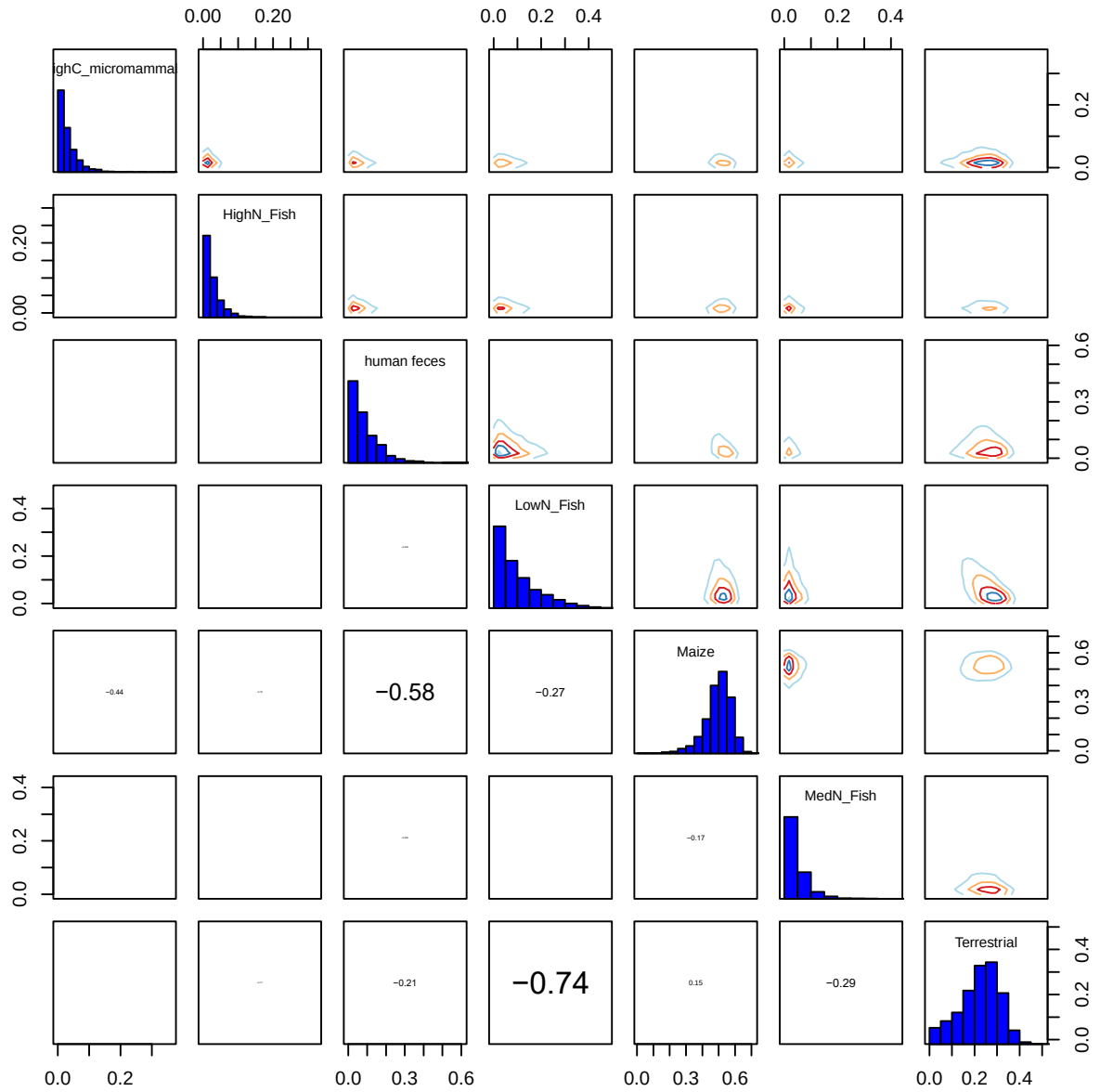
Kelly Campbell Village Dog Model 2 Diagnostics (n=8)

Gelman Diagnostic (variables=16)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=16)

Chain 1	Chain 2	Chain 3
0	0	0



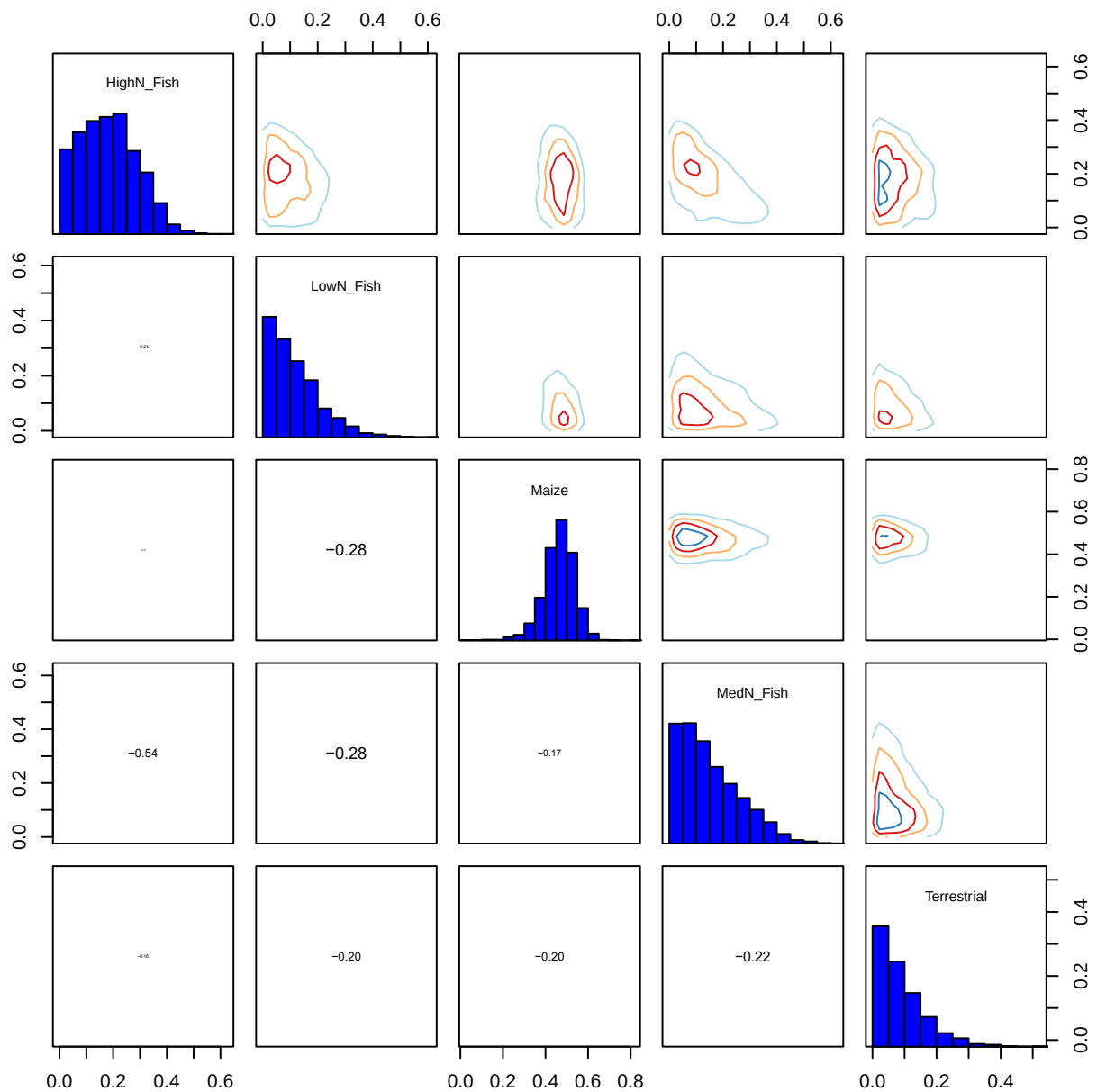
Ossossoané Ossuary Human Model Diagnostics (n=5)

Gelman Diagnostic (variables=11)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=11)

Chain 1	Chain 2	Chain 3
1	0	0



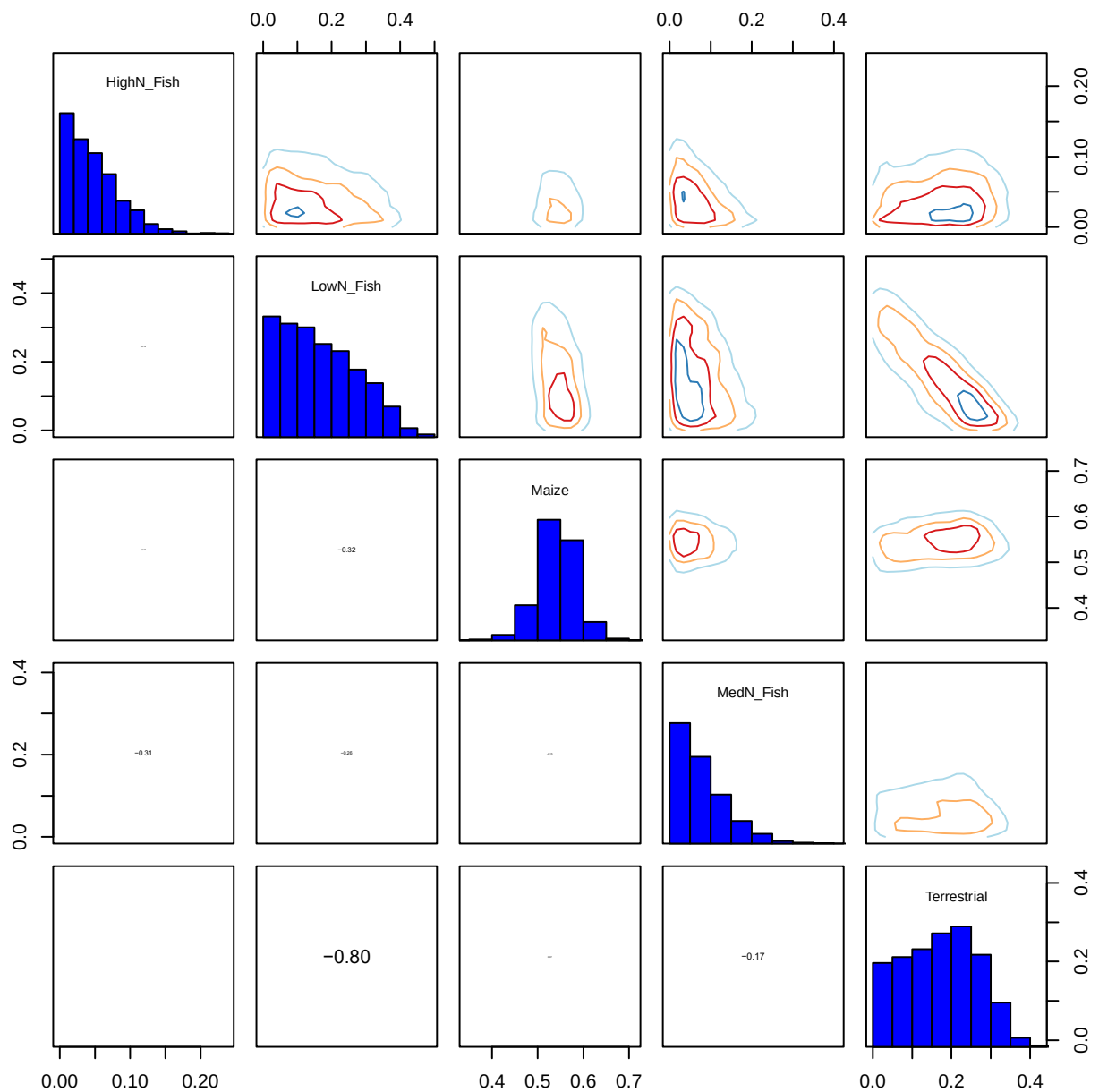
Ossossoané Village Dog Model 1 Diagnostics (n=11)

Gelman Diagnostic (variables=17)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=17)

Chain 1	Chain 2	Chain 3
0	0	0



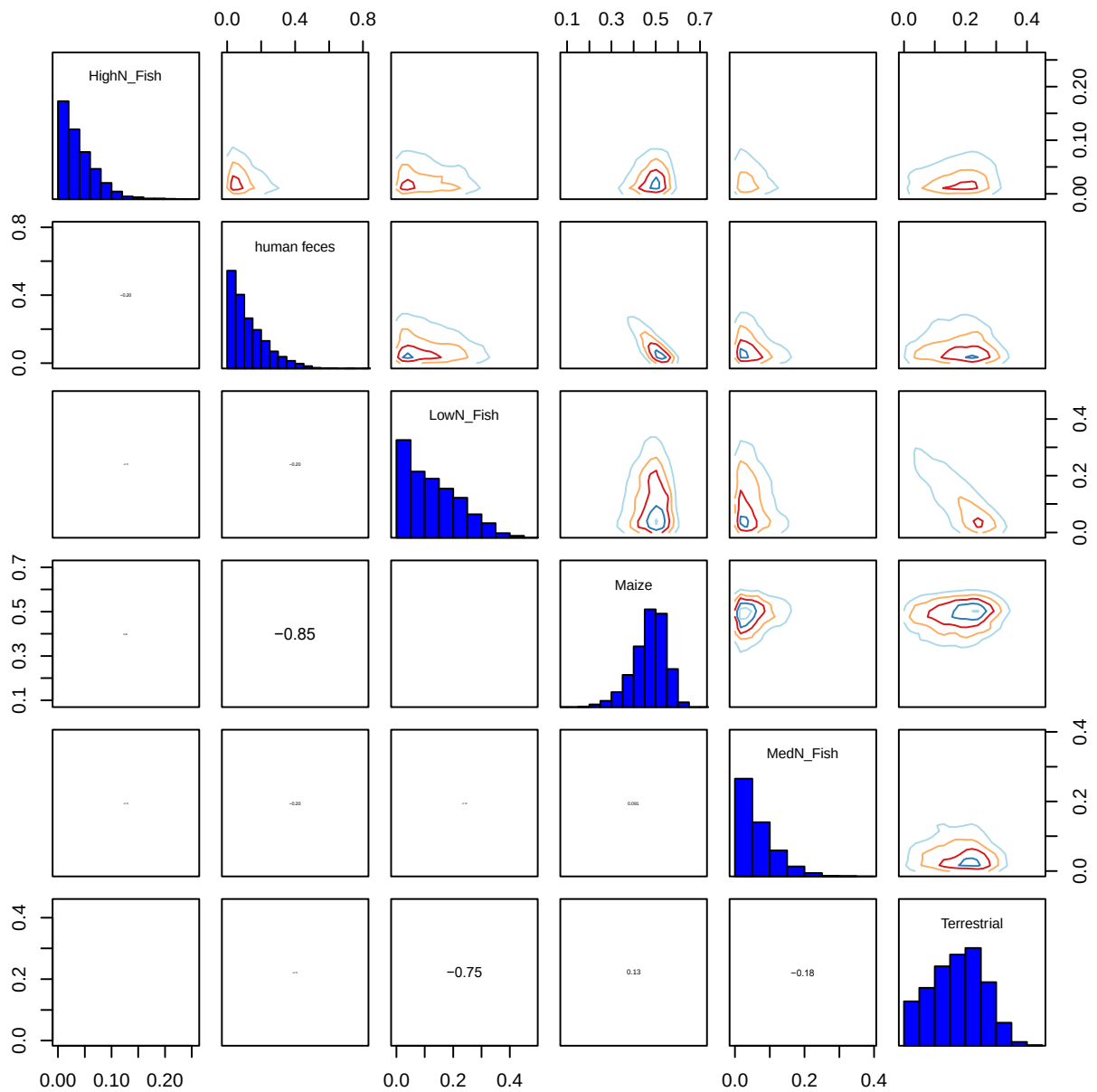
Ossossoané Village Dog Model 2 Diagnostics (n=11)

Gelman Diagnostic (variables=18)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic variables=18)

Chain 1	Chain 2	Chain 3
0	1	0



Ossossoané Village Dog Model 3 Diagnostics (n=11)

Gelman Diagnostic (variables=19)

>1.01	>1.05	>1.10
0	0	0

Geweke diagnostic (variables=19)

Chain 1	Chain 2	Chain 3
0	0	0

