

The effects of high dose of two manganese supplements (organic and inorganic) on the rumen microbial ecosystem

Direct counts of rumen ciliates per gram of wet rumen content, CPG, log natural transformation, Ln

K, control group, 34.3 mg Mn/kg DM feed, no manganese supplement

IMn, inorganic manganese supplement, 182.7 mg Mn/kg DM feed

OMn, organic manganese supplement, 184 mg Mn/kg DM feed

t - total counts
ent - Entodinium
epi - Epidinium
eud - Eudiplodinium
iso - Isotricha
das - Dasytricha
dip - Diplodinium

t-k	t-imn	t-omn	ent-k	ent-imn	ent-omn	epi-k	epi-imn	epi-omn	eud-k	eud-imn	eud-omn	iso-k	iso-imn	iso-omn	das-k	das-imn	das-omn	dip-K	dip-IMn	dip-OMn
13.36	13.25		12.81	12.89		12.00	11.33		9.68	10.15		9.97	9.27		11.14	10.92				
13.40	13.34	13.56	12.91	13.09	13.38	10.72	11.13	11.18	9.96	10.24	9.49	9.44	9.00	8.87	11.14	10.35	10.39	12.00	8.00	9.00
13.43	13.57	13.27	13.22	13.43	13.12	11.16	10.63	10.65				7.74		7.90	10.90	11.01	10.44			
12.68	13.71	14.02	12.62	13.58	13.85		11.02	11.71		8.68		4.87	8.56	8.22	9.82	10.62	11.02			
12.37	14.21		11.97	14.09		10.27	11.64		9.71			6.83	9.21		10.35	10.77		8.00		
13.77	14.03	13.07	13.59	13.79	12.89	11.37	12.18	10.41	10.33		9.66	8.94	8.74	8.11	10.64	10.94	10.29		9.00	

	t-k	t-imn	t-omn	ent-k	ent-imn	ent-omn	epi-k	epi-imn	epi-omn	eud-k	eud-imn	eud-omn	iso-k	iso-imn	iso-omn	das-k	das-imn	das-omn	dip-K	dip-IMn	dip-OMn
Number of values	6	6	4	6	6	4	5	6	4	4	3	2	6	5	4	6	6	4	1	3	1
Minimum	12.37	13.25	13.07	11.97	12.89	12.89	10.27	10.63	10.41	9.680	8.680	9.490	4.870	8.560	7.900	9.820	10.35	10.29	12.00	8.000	9.000
25% Percentile	12.60	13.32	13.12	12.46	13.04	12.95	10.50	10.92	10.47	9.688	8.680	9.490	6.340	8.650	7.953	10.22	10.55	10.32	12.00	8.000	9.000
Median	13.38	13.64	13.42	12.86	13.51	13.25	11.16	11.23	10.92	9.835	10.15	9.575	8.340	9.000	8.165	10.77	10.85	10.42	12.00	8.000	9.000
75% Percentile	13.52	14.08	13.91	13.31	13.87	13.73	11.69	11.78	11.58	10.24	10.24	9.660	9.573	9.240	8.708	11.14	10.96	10.88	12.00	9.000	9.000
Maximum	13.77	14.21	14.02	13.59	14.09	13.85	12.00	12.18	11.71	10.33	10.24	9.660	9.970	9.270	8.870	11.14	11.01	11.02	12.00	9.000	9.000
Mean	13.17	13.69	13.48	12.85	13.48	13.31	11.10	11.32	10.99	9.920	9.690	9.575	7.965	8.956	8.275	10.67	10.77	10.54	12.00	8.333	9.000
Std. Deviation	0.5285	0.3786	0.4124	0.5508	0.4429	0.4119	0.6557	0.5375	0.5792	0.3008	0.8758	0.1202	1.901	0.3035	0.4183	0.5139	0.2481	0.3293	0.0	0.5774	0.0
Std. Error	0.2158	0.1546	0.2062	0.2249	0.1808	0.2060	0.2932	0.2194	0.2896	0.1504	0.5057	0.08500	0.7760	0.1357	0.2091	0.2098	0.1013	0.1646	0.0	0.3333	0.0
Lower 95% CI of mean	12.61	13.29	12.82	12.28	13.01	12.65	10.29	10.76	10.07	9.441	7.514	8.495	5.970	8.579	7.609	10.13	10.51	10.01	0.0	6.899	0.0
Upper 95% CI of mean	13.72	14.08	14.14	13.43	13.94	13.97	11.92	11.89	11.91	10.40	11.87	10.66	9.960	9.333	8.941	11.20	11.03	11.06	0.0	9.768	0.0
Sum	79.01	82.11	53.92	77.12	80.87	53.24	55.52	67.93	43.95	39.68	29.07	19.15	47.79	44.78	33.10	63.99	64.61	42.14	12.00	25.00	9.000

Table Analyzed	Data 7-ciliaty-.cpg.ln.vsetko		
Kruskal-Wallis test			
P value	0.3368		
Exact or approximate P value?	Gaussian Approximation		
P value summary	ns		
Do the medians vary signif. (P < 0.05)	No		
Number of groups	3		
Kruskal-Wallis statistic	2.176		
Dunn's Multiple Comparison Test	Difference in rank sum	Significant? P < 0.05?	Summary
t-k vs t-imn	-4.000	No	ns
t-k vs t-omn	-1.333	No	ns
t-imn vs t-omn	2.667	No	ns

Table Analyzed	Data 7-ciliaty-.cpg.ln.vsetko		
Kruskal-Wallis test			
P value	0.1648		
Exact or approximate P value?	Gaussian Approximation		
P value summary	ns		
Do the medians vary signif. (P < 0.05)	No		
Number of groups	3		
Kruskal-Wallis statistic	3.605		
Dunn's Multiple Comparison Test	Difference in rank sum	Significant? P < 0.05?	Summary
ent-k vs ent-imn	-5.083	No	ns
ent-k vs ent-omn	-3.708	No	ns
ent-imn vs ent-omn	1.375	No	ns

Table Analyzed	Data 7-ciliaty-.cpg.ln.vsetko		
Kruskal-Wallis test			
P value	0.8113		
Exact or approximate P value?	Gaussian Approximation		
P value summary	ns		
Do the medians vary signif. (P < 0.05)	No		
Number of groups	3		
Kruskal-Wallis statistic	0.4183		
Dunn's Multiple Comparison Test	Difference in rank sum	Significant? P < 0.05?	Summary
epi-k vs epi-imn	-1.033	No	ns
epi-k vs epi-omn	0.8000	No	ns
epi-imn vs epi-omn	1.833	No	ns

Table Analyzed	Data 7-ciliaty-.cpg.ln.vsetko		
Kruskal-Wallis test			
P value	0.3256		
Exact or approximate P value?	Gaussian Approximation		
P value summary	ns		
Do the medians vary signif. (P < 0.05)	No		
Number of groups	3		
Kruskal-Wallis statistic	2.244		
Dunn's Multiple Comparison Test	Difference in rank sum	Significant? P < 0.05?	Summary
eud-k vs eud-imn	0.6667	No	ns
eud-k vs eud-omn	3.500	No	ns
eud-imn vs eud-omn	2.833	No	ns

Table Analyzed	Data 7-ciliaty-.cpg.ln.vsetko		
Kruskal-Wallis test			
P value	0.3526		
Exact or approximate P value?	Gaussian Approximation		
P value summary	ns		
Do the medians vary signif. (P < 0.05)	No		
Number of groups	3		
Kruskal-Wallis statistic	2.085		
Dunn's Multiple Comparison Test	Difference in rank sum	Significant? P < 0.05?	Summary
iso-k vs iso-imn	-2.700	No	ns
iso-k vs iso-omn	1.500	No	ns
iso-imn vs iso-omn	4.200	No	ns

Table Analyzed	Data 7-ciliaty-.cpg.ln.vsetko		
Kruskal-Wallis test			
P value	0.3256		
Exact or approximate P value?	Gaussian Approximation		
P value summary	ns		
Do the medians vary signif. (P < 0.05)	No		
Number of groups	3		
Kruskal-Wallis statistic	2.244		
Dunn's Multiple Comparison Test	Difference in rank sum	Significant? P < 0.05?	Summary
eud-k vs eud-imn	0.6667	No	ns
eud-k vs eud-omn	3.500	No	ns
eud-imn vs eud-omn	2.833	No	ns