

Supplementary Materials: Biomarker Evaluation and Toxic Effects of an Acute Oral and Systemic Fumonisin Exposure of Pigs with a Special Focus on Dietary Fumonisin Esterase Supplementation

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Table S1. Red blood cell count (RBCC) for all groups over 120 h sampling period (LSmeans, $n = 6/\text{group}$).

	Group	Time after toxin application (h)								±PSEM [§]	Main effects, p -values (F -test)		
		0	6	12	24	48	72	96	120		Group	Time	Group×Time
RBC	CON	6.44	6.23	5.67	5.79	5.80	5.13	5.18	5.74	0.24	0.800	0.004	0.717
T/L	FB1 iv	6.15	5.67	6.89	5.43	6.78	5.63	5.30	5.74	0.24			
(5.8-8.1)*	HFB1 iv	6.57	5.51	6.37	5.03	5.14	6.04	5.06	5.53	0.24			
	FUM po	6.42	5.85	5.41	5.72	6.16	5.87	5.31	5.90	0.24			
	FumD po	6.44	5.50	5.20	5.71	5.47	5.30	5.18	5.64	0.24			
HGB	CON	7.12	6.76	6.14	5.64	6.44	5.66	5.79	6.44	0.21	0.613	0.001	0.636
mmol/L	FB1 iv	6.88	6.26	7.44	6.01	7.48	6.33	5.98	6.51	0.21			
(6.7-9.2)*	HFB1 iv	7.45	6.29	7.12	5.69	5.74	6.69	5.81	6.32	0.21			
	FUM po	7.11	6.79	6.20	6.23	7.23	6.75	6.16	6.93	0.21			
	FumD po	7.60	6.39	6.06	6.67	5.99	6.20	6.05	6.73	0.21			
HCT	CON	0.36	0.34	0.31	0.32	0.32	0.29	0.29	0.33	0.01	0.778	0.010	0.739
L/L	FB1 iv	0.34	0.31	0.37	0.30	0.37	0.31	0.30	0.33	0.01			
(0.30-0.42)**	HFB1 iv	0.36	0.31	0.35	0.28	0.29	0.34	0.29	0.32	0.01			
	FUM po	0.36	0.33	0.31	0.32	0.36	0.33	0.31	0.35	0.01			
	FumD po	0.36	0.31	0.29	0.32	0.31	0.30	0.30	0.33	0.01			
MCV	CON	56.02	55.69	55.61	56.11	56.37	56.66	57.06	57.69	0.14	0.762	<0.001	0.903
fL	FB1 iv	56.02	55.87	55.72	56.14	56.37	56.91	57.52	58.16	0.14			
(50-65)*	HFB1 iv	56.02	55.96	55.72	56.31	56.42	56.79	57.49	58.19	0.14			
	FUM po	56.01	56.05	56.16	56.28	56.53	56.75	57.06	58.21	0.14			
	FumD po	56.01	55.65	55.91	56.03	56.36	56.86	57.03	58.13	0.14			
MCH	CON	1.14	1.13	1.13	1.04	1.15	1.14	1.15	1.16	0.01	0.394	<0.001	<0.001
fmol	FB1 iv	1.14	1.13	1.12	1.13	1.13	1.14	1.15	1.15	0.01			
(1.0-1.3)*	HFB1 iv	1.14	1.15	1.13	1.14	1.13	1.14	1.15	1.15	0.01			

	FUM_{po}	1.14	1.18	1.16	1.13	1.16	1.17	1.17	1.19	0.01			
	FumD_{po}	1.15	1.13	1.14	1.15	1.09	1.15	1.14	1.16	0.01			
MCHC	CON	20.25	20.15	20.16	18.39	20.21	19.91	20.02	19.88	0.21	0.503	0.004	0.020
mmol/L	FB1_{iv}	20.35	20.23	20.12	20.12	20.11	20.00	19.94	19.78	0.21			
(19-22)*	HFB1_{iv}	20.35	20.52	20.16	20.22	20.02	20.05	19.99	19.74	0.21			
	FUM_{po}	20.26	20.88	20.59	19.91	20.41	20.49	20.47	20.32	0.21			
	FumD_{po}	20.45	20.34	20.42	20.41	19.24	20.13	19.89	19.97	0.21			
RDW	CON	16.31	16.32	16.22	16.46	16.31	16.76	16.67	17.07	0.10	0.919	<0.001	0.549
% CV	FB1_{iv}	16.40	16.35	16.57	16.30	16.63	16.43	16.62	17.08	0.10			
(0-50)*	HFB1_{iv}	16.36	16.51	16.32	16.21	16.32	16.62	16.69	17.19	0.10			
	FUM_{po}	16.34	16.17	16.27	16.39	16.22	16.57	16.42	17.09	0.10			
	FumD_{po}	16.35	16.47	16.37	16.27	16.52	16.65	16.58	17.18	0.10			
PLT	CON	417.26	369.76	327.43	374.76	347.76	438.10	476.26	459.93	18.64	0.215	<0.001	0.051
G/L	FB1_{iv}	438.98	361.48	295.15	358.31	306.31	435.15	404.98	389.15	19.37			
(220-620)*	HFB1_{iv}	406.00	395.66	328.83	392.50	465.16	479.66	547.66	512.50	19.32			
	FUM_{po}	438.12	382.95	340.78	348.45	364.28	412.45	411.28	396.28	19.29			
	FumD_{po}	410.81	352.98	356.48	340.31	418.31	421.81	440.98	430.15	18.94			
PCT	CON	0.21	0.18	0.16	0.20	0.18	0.22	0.25	0.24	0.01	0.677	<0.001	0.037
%	FB1_{iv}	0.25	0.20	0.14	0.20	0.16	0.25	0.23	0.23	0.01			
	HFB1_{iv}	0.27	0.21	0.16	0.15	0.20	0.25	0.25	0.31	0.01			
	FUM_{po}	0.21	0.21	0.19	0.17	0.19	0.21	0.22	0.22	0.01			
	FumD_{po}	0.22	0.16	0.18	0.17	0.22	0.23	0.23	0.23	0.01			
MPV	CON	5.37	5.13	5.07	5.72	5.45	5.35	5.60	5.47	0.11	0.889	<0.001	0.153
fL	FB1_{iv}	5.36	5.28	4.96	5.40	5.43	5.45	5.41	5.63	0.11			
	HFB1_{iv}	5.60	5.35	4.98	5.17	5.47	5.63	5.62	5.75	0.11			
	FUM_{po}	5.65	5.37	5.14	5.15	5.47	5.80	5.65	5.49	0.11			
	FumD_{po}	5.37	4.65	5.03	5.33	5.61	5.55	5.38	5.60	0.11			
PDW	CON	14.71	15.38	15.81	15.28	14.93	14.96	15.08	15.75	0.17	0.528	0.672	0.063
%	FB1_{iv}	14.77	14.66	15.29	15.19	14.97	15.47	14.89	15.11	0.17			
	HFB1_{iv}	14.90	14.95	15.10	14.83	15.67	15.18	14.77	15.03	0.17			
	FUM_{po}	14.82	15.37	15.70	15.32	14.94	15.70	15.04	14.94	0.17			
	FumD_{po}	16.29	14.92	14.92	14.48	14.58	14.42	14.85	14.45	0.18			

Reference values according to *Kraft and Dürr [25] or **Kixmüller [26]; RBC = red blood cells, HGB = hemoglobin, HCT = hematocrit, MCV = mean cell volume, MCH = mean corpuscular hemoglobin, MCHC = mean corpuscular hemoglobin concentration, RDW = red cell distribution width, PLT = platelets/thrombocytes, PCT =

plateletcrit/thrombocrit, MPV = mean platelet volume , PDW = platelet distribution width. Results were evaluated with SAS using t = 0 as co-variable for each parameter. § PSEM pooled standard error of means.

Table S2. Total (G/L) and differential leukocytes count (% of total leukocyte count) for all groups over a 120 h sampling period (LSmeans, n = 6/group).

	Group	Time after toxin application (h)								±PSEM	Main effects (F-test p-value)		
		0	6	12	24	48	72	96	120		Group	Time	Group×Time
Leukocytes G/L (10-22)*	CON	15.5	18.9	17.1	16.0	16.6	16.2	17.4	20.5	0.8	0.234	<0.001	0.172
	FB1iv	17.4	19.0	19.9	16.1	16.0	17.2	15.5	17.9	0.8			
	HFB1iv	16.2	18.8	15.8	17.6	16.0	19.3	18.4	19.1	0.8			
	FUMpo	16.6	19.1	17.6	14.5	15.8	13.9	14.2	16.8	0.8			
	FumDpo	15.6	16.4	16.9	14.3	14.9	14.3	15.5	16.7	0.8			
Monocytes % (0-5)*	CON	3.1	5.1	7.8	9.6	6.3	2.8	2.6	3.5	0.3	0.003	0.059	<0.001
	FB1iv	2.8	4.0	3.3	2.9	3.1	3.9	4.7	3.9	0.3			
	HFB1iv	3.7	2.4	3.1	4.5	4.3	3.6	5.5	5.8	0.3			
	FUMpo	3.5	3.5	1.8	3.0	5.8	4.8	5.3	1.7	0.3			
	FumDpo	4.6	1.6	2.9	1.9	3.4	2.3	5.1	4.9	0.3			
Eosinophils % (0-6)*	CON	1.4	1.4	5.1	1.9	2.6	1.8	0.1	0.5	0.2	0.696	<0.001	<0.001
	FB1iv	1.7	4.7	3.8	2.9	1.4	1.1	0.7	1.2	0.2			
	HFB1iv	1.5	2.6	3.5	2.3	1.5	0.7	0.6	1.3	0.2			
	FUMpo	1.2	3.2	5.0	1.0	1.2	1.0	0.7	1.9	0.2			
	FumDpo	2.1	4.1	4.8	2.3	0.8	1.0	1.5	0.2	0.3			
Basophils % (0-2)*	CON	0.1	0.6	0.1	0.1	0.4	0.5	0.3	0.1	0.1	0.014	0.304	<0.001
	FB1iv	0.4	0.2	0.4	0.7	0.2	0.5	0.9	0.6	0.1			
	HFB1iv	0.2	0.2	0.0	0.8	0.1	0.4	0.6	0.0	0.1			
	FUMpo	0.3	0.0	0.3	0.3	1.0	0.5	0.0	0.2	0.1			
	FumDpo	0.6	0.4	0.6	0.4	0.6	0.4	0.7	1.2	0.1			

*Reference values according to Kraft and Dürr [25]. Results were evaluated with SAS using t = 0 as co-variable for each parameter.

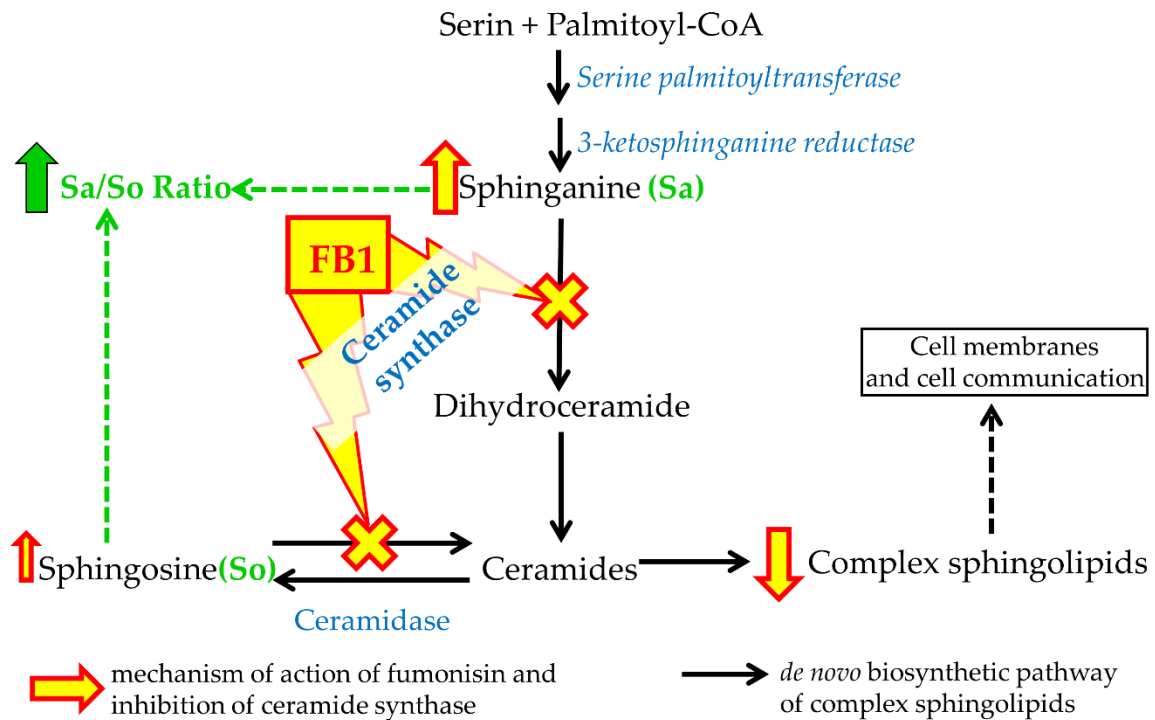


Figure S1. Inhibition of ceramide synthase (CerS) by fumonisins. Adapted and adjusted from Voss, Smith and Haschek [11].

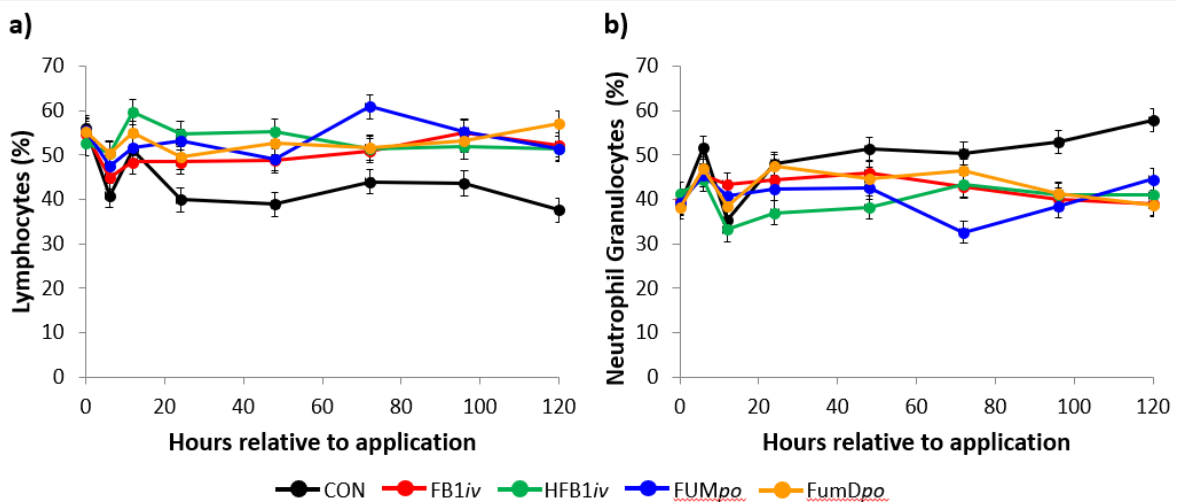


Figure S2. (a) Lymphocyte and (b) neutrophil granulocytes proportion over the entire experimental period. Data represent LSmeans (\pm SEM, $n = 6$ /group) and statistical main effects were distributed as follows: (a) $p_{\text{group}} < 0.001$, $p_{\text{time}} < 0.001$, $p_{\text{group} \times \text{time}} < 0.001$; (b) $p_{\text{group}} < 0.001$, $p_{\text{time}} < 0.001$, $p_{\text{group} \times \text{time}} < 0.001$. Reference values lymphocytes: 49–85% and neutrophil granulocytes: 10–46% (Kraft and Dürre [25]). CON: control; FB1iv: 139 nmol FB1/kg-BW⁻¹; HFB1iv: 139 nmol HFB1/kg-BW⁻¹; FUMpo: 120 mg FB1 + 48 mg FB2 + 14 mg FB3/kg diet; FumDpo: 120 mg FB1 + 48 mg FB2 + 14 mg FB3/kg diet and 240 U fumonisin esterase/kg diet).