

Supplementary file

Table S1. Growth performance of Nile tilapia at week 2.

	Treatment			
	C	MT	MZ	MZ + MT
Weight gain (g)	5.79 ± 1.74	1.66 ± 2.99	4.71 ± 1.13	3.04 ± 2.48
Percentage weight gain (%)	44.51 ± 13.37	12.79 ± 22.96	36.26 ± 8.71	23.39 ± 19
Daily weight gain (g/day)	0.41 ± 0.12	0.12 ± 0.21	0.34 ± 0.08	0.22 ± 0.18
Specific growth rate (%/day)	1.20 ± 0.35	0.25 ± 0.60	1.01 ± 0.23	0.58 ± 0.54
Feed conversion ratio	0.86 ± 2.10	1.10 ± 2.36	1.49 ± 0.75	0.99 ± 0.96

Table S2. Biochemical parameters of Nile tilapia blood at week 2.

	Treatment			
	C	MT	MZ	MZ + MT
Total protein (g/L)	25.22 ± 3.67	24.95 ± 1.63	25.17 ± 1.10	26.35 ± 0.9
Albumin (g/L)	6.80 ± 1.52	6.88 ± 0.66	8.12 ± 0.50	8.75 ± 0.36
Globulin (g/L)	18.42 ± 1.53	18.07 ± 1.95	17.05 ± 0.66	17.60 ± 0.65
ALT (U/L)	28.0 ± 4.39	22.17 ± 2.59	28.83 ± 5.49	33.17 ± 4.20
AST (U/L)	54.20 ± 4.04	57.83 ± 4.35	53.67 ± 8.61	47.17 ± 2.70



Test Results for Mycotoxins Analysis

Supplier name	Chair for Fish Diseases, LMU Munich
Date sample received	31.01.2022.
Date results sent back	11.02.2022.

Mycotoxins results

Sample number	Sample Name	Result (µg/kg) or ppb relative to a feed with a moisture content of 12 %										
		Aflatoxin				Ochratoxin A	Zearalenone	Deoxynivalenol	Fumonisin		HT-2	T-2
		B1	B2	G1	G2				B1	B2		
S22-01-012	DIET 1	< 0.4	< 0.4	< 0.4	< 0.4	< 1.6	< 16	< 64	< 40	< 40	< 9.6	< 9.6
S22-01-013	DIET 2	< 0.4	< 0.4	< 0.4	< 0.4	< 1.6	< 16	< 64	< 40	< 40	< 9.6	< 9.6
S22-01-014	DIET 3	31.67	2.45	< 0.4	< 0.4	< 1.6	53.48	145	405	124	< 9.6	< 9.6
S22-01-015	DIET 4	35.85	2.41	< 0.4	< 0.4	< 1.6	51.39	148	421	137	< 9.6	< 9.6

Note:

The samples were analysed as per EU guidelines

- For EU maximum permitted limits for mycotoxins in feed please follow this link:
<https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1548058686527&uri=CELEX:02002L0032-20171225>

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Figure S1. Results of the feed analysis, representing diets, which were utilized in the experiment. Diet 1 – Control group, Diet 2 - MinazelPlus® group, Diet 3 – Mycotoxins group, Diet 4 - MinazelPlus® + Mycotoxins.

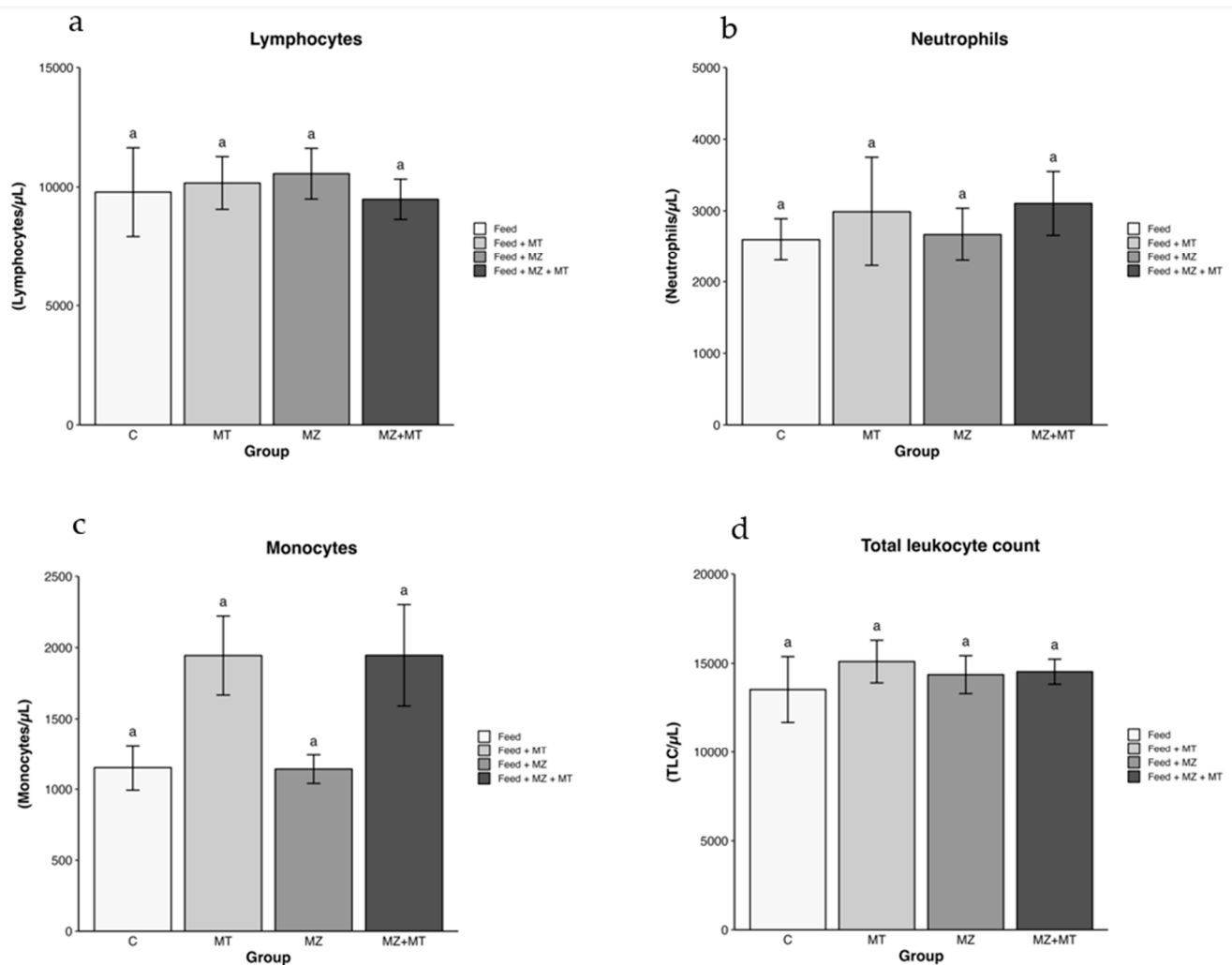


Figure S2. Haematological parameters of Nile tilapia; values are means \pm SEM, $n=6$. Different letters designate statistical difference between groups ($p \leq 0.05$, no statistically significant differences were noted). (a) Lymphocyte counts, (b) Neutrophil counts, (c) Monocyte counts, (d) Total leukocyte counts. C (Control group), MT (Mycotoxins group), MZ (Minazel Plus® group), MZ + MT (Minazel Plus® and Mycotoxins group).

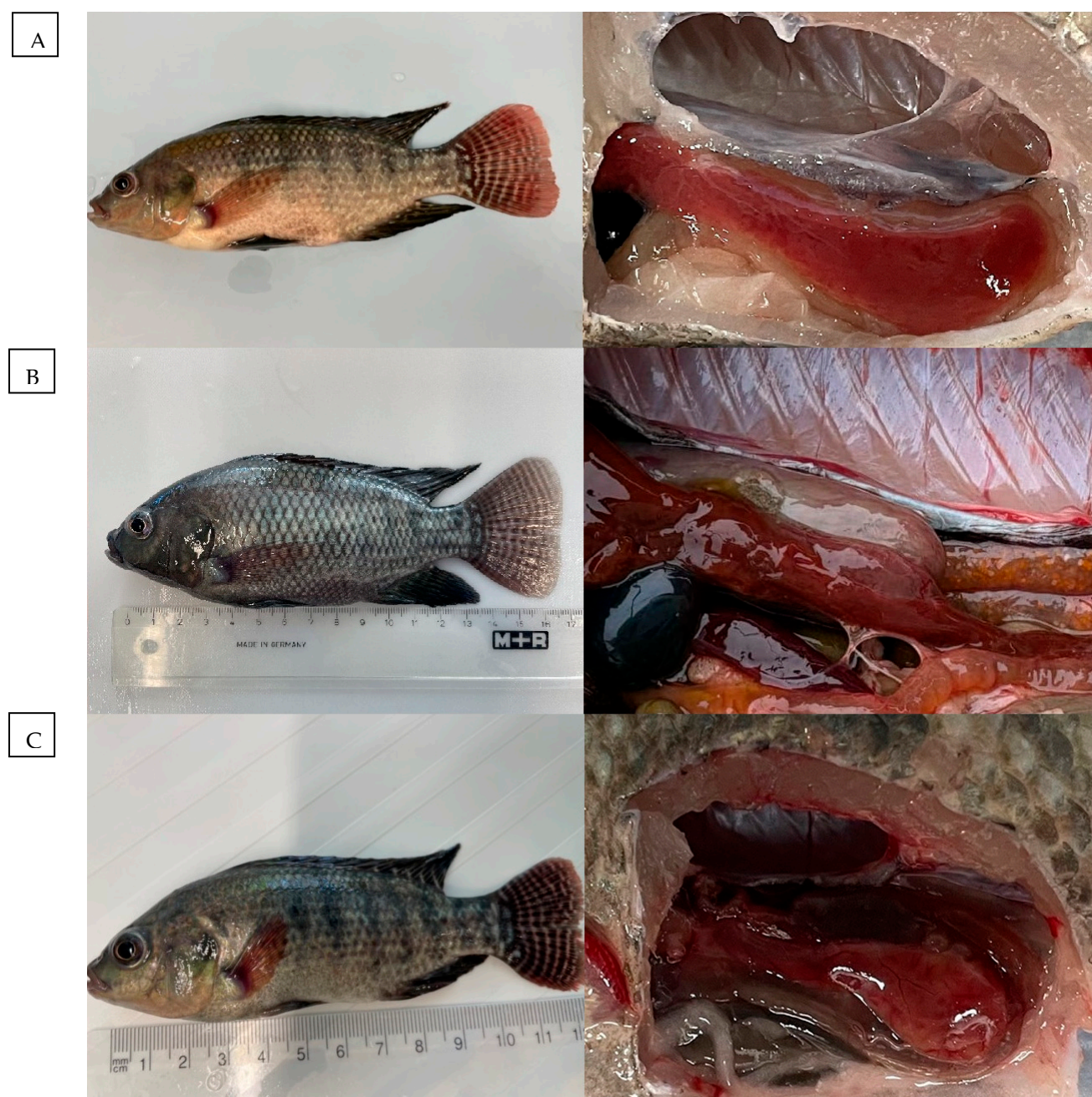


Figure S3. Clinical signs of Nile tilapia, exposed to various diets utilized in the experiment during the 42 days of exposure. **A.** Control fish external condition (left) and normal liver (right) **B.** MinazelPlus® diet group fish external condition (left) and normal liver (right) **C.** MinazelPlus® and multiple mycotoxin group fish external condition (left) and normal liver (right).

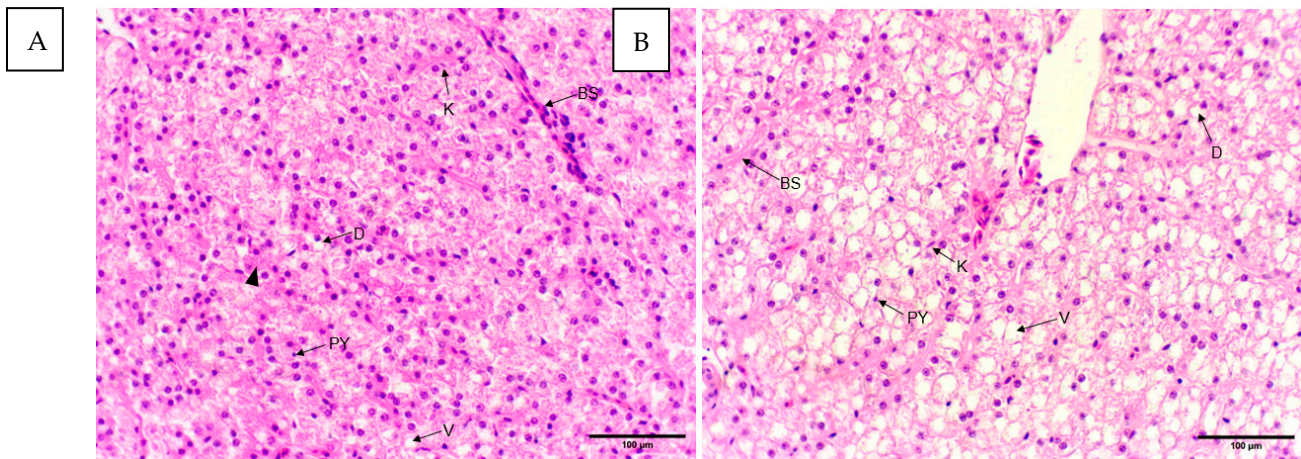


Figure S4. **A.** Mycotoxins group showed severe hepatocytes deformation, V - vacuolar degeneration of hepatocytes, disarrangement of cells, hepatocyte cloudiness, BS - congestion of blood sinusoids, PY - pyknosis, and coagulation necrosis of the hepatocytes (arrowheads). **B.** Mycotoxins and MinazelPlus® group showed PY - pyknosis, BS - blood sinusoid, D - moderate degeneration of hepatocytes. It showed V - moderate vacuolation of hepatocytes, moderate fatty changes in hepatocytes.