

Efficacy of MT.X+[®] on decreasing the effects of deoxynivalenol on piglets



Experimental trial – Samitec, Brazil, 2020



Experimental design

The study was conducted by the Samitec Institute of Analytical, Microbiological and Technological Solutions in March 2020. 30 male piglets with an average body weight of 9.27 kg were distributed into 5 treatments with 6 replicates each. The trial was run for 28 days. Treatments differed in deoxynivalenol (DON) contamination and inclusion rate of MT.X+[®] (Table). The piglets received an iso-nutritive diet formulated according to NRC 2012 and were fed *ad libitum*.

Treatments on 6 piglets/group	DON (ppm)	MT.X+ [®] (kg/T)
T1 (Negative control)	-	-
T2 (MT.X+[®] 5kg/T)	-	5
T3 (DON)	3	-
T4 (DON + MT.X+[®] 2.5kg/T)	3	2.5
T5 (DON + MT.X+[®] 5kg/T)	3	5

Note that the high level of DON used in this trial (3 ppm) was set up to obtain significant effects under experimental conditions, in the short term, with mono-contamination and clean conditions. In the field, the threshold level causing deleterious effects on animals is far lower.

Measurements

- Performance: Feed intake and body weight were recorded at D7, D14, D21 and D28. Feed Conversion Ratio (FCR) was calculated at D28.
- Individual relative liver weight (RWL, ratio of the liver weight and piglet weight) and serum total proteins were measured at D28.

Data were subjected to ANOVA and Bonferroni tests ($P \leq 0.05$).

Results

Feed intake (g/day/piglet)

Period	Negative control	MT.X+ [®] 5kg/T	DON	DON + MT.X+ [®] 2.5kg/T	DON + MT.X+ [®] 5kg/T
Day 1-7	739	755	696	681	733
Day 1-14	816	815	760	755	805
Day 1-21	1,023 ^a	1,045 ^a	875 ^b	869 ^b	993 ^{ab}
Day 1-28	1,137 ^a	1,142 ^a	961 ^b	970 ^b	1,099 ^a

^{a-c} Means on a line with different letters differ by the Bonferroni test ($P \leq 0.05$).

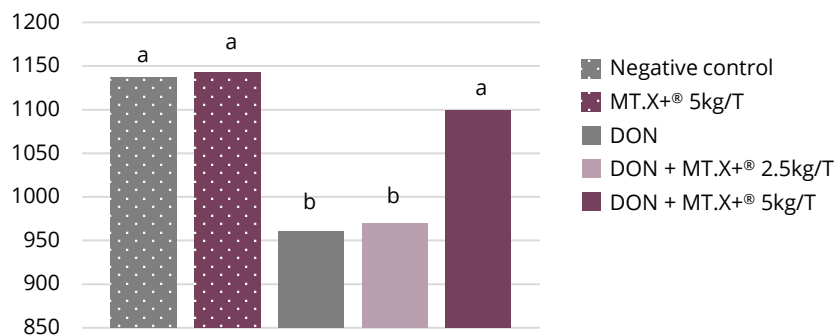
Body weight (kg/piglet)

Date	Negative control	MT.X+ [®] 5kg/T	DON	DON + MT.X+ [®] 2.5kg/T	DON + MT.X+ [®] 5kg/T
Day 1	9.38	9.31	9.26	9.23	9.18
Day 7	13.78 ^a	13.89 ^a	12.83 ^b	12.83 ^b	13.88 ^b
Day 14	17.46 ^a	17.62 ^a	15.93 ^b	15.87 ^b	16,99 ^{ab}
Day 21	23.84 ^a	24.54 ^a	19.83 ^b	19.84 ^b	22.92 ^{ab}
Day 28	26.75 ^a	27.51 ^a	22.73 ^b	22.73 ^b	26.22 ^{ab}

^{a-c} Means on a line with different letters differ by the Bonferroni test ($P \leq 0.05$).



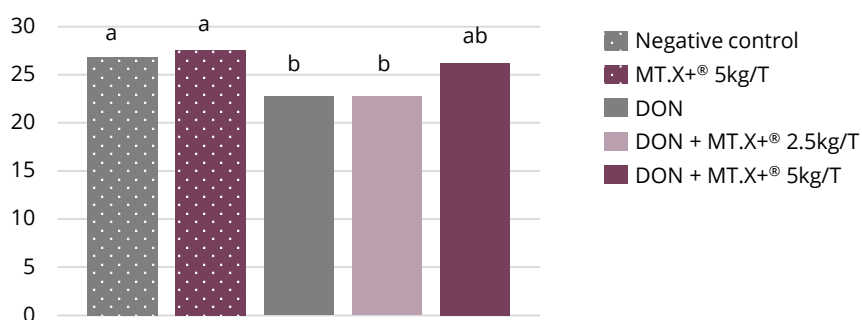
> Feed intake from D1 to D28 (g/day/piglet)



The deoxynivalenol exposure strongly decreased the feed intake compared to the negative control (-15%, $P \leq 0.05$). The inclusion of 5kg/T of MT.X+[®] in the contaminated diet significantly improved the feed consumption allowing to get back to the same level as the control group ($P \leq 0.05$).

^{a-c} Means on a line with different letters differ by the Bonferroni test ($P \leq 0.05$).

> Final body weight (kg/piglet)



The exposure to 3 ppm of deoxynivalenol strongly decreased the piglets' weight compared to the negative control (-15%, $P \leq 0.05$). The inclusion of 5 kg/T of MT.X+[®] in the contaminated diet allowed to fully recover the body weight compared to the negative control ($P \leq 0.05$).

^{a-c} Means on a line with different letters differ by the Bonferroni test ($P \leq 0.05$).

Feed intake and body weight were positively impacted at the same proportion, so no significant effect could be measured on feed conversion ratio.

There was no impact of any of the treatments on the relative weight of the liver nor on serum total proteins.

Conclusion

According to the evaluated parameters, the use of MT.X+[®] (5kg/T) strongly mitigated the effects caused by a very high deoxynivalenol (DON) contamination in the feed (3 ppm) during the experimental period of 28 days. MT.X+[®] permits to fully recover the loss in feed intake and body weight.

MT.X+[®], improves protection, improves performance!