

THE ORAL BIOAVAILABILITY OF AFLATOXIN B1 IS REDUCED BY AN ANTI-MYCOTOXIN AGENT IN PIGS IN A TOXICOKINETIC STUDY

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INTRODUCTION

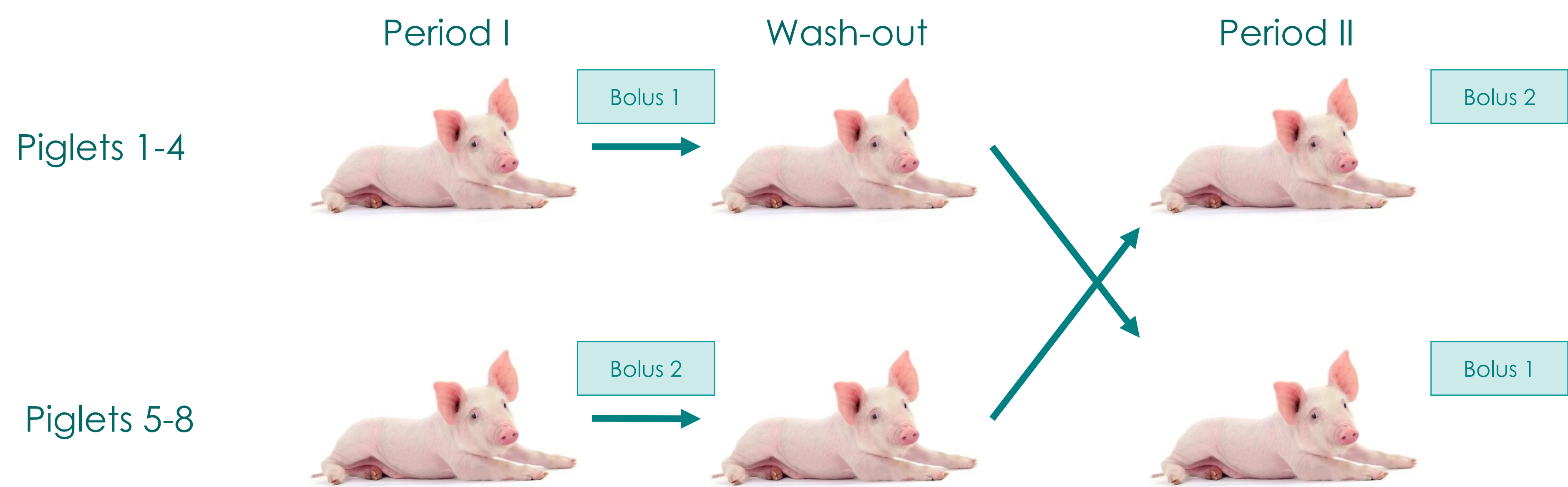
Toxicokinetic studies based on absorption, distribution, metabolism and excretion (ADME) of mycotoxins, are crucial for the evaluation of the efficacy of mycotoxin detoxifiers in swine. The ineffective detoxification and excretion of aflatoxins in swine, causes them to become particularly sensitive to aflatoxin B1 (AFB1) exposure (Popescu et al., 2022).

OBJECTIVE

The aim of the present study was to determine the effectiveness of an anti-mycotoxin agent (AMA) based on minerals, phytochemicals and yeast products on the reduction of the oral bioavailability of AFB1 by measuring the plasma concentration-time profile of AFB1 in piglets.

MATERIALS AND METHODS

Cross-over design

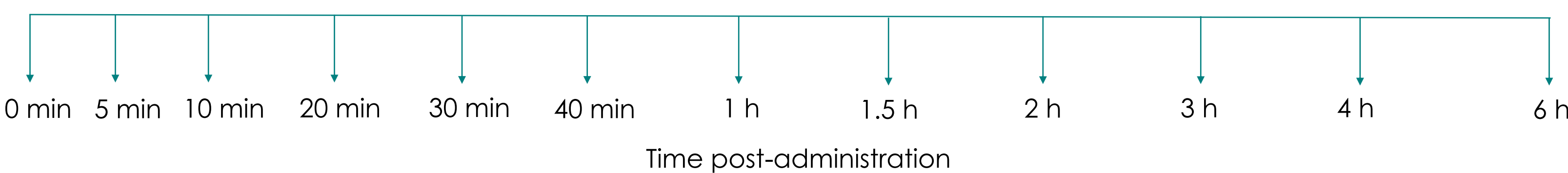


 Eight 7-week-old hybrid (Belgian Landrace x Piétrain) piglets, females ♀

	Bolus 1	Bolus 2
Aflatoxin B1	0.1 mg/kg BW	0.1 mg/kg BW
Anti-mycotoxin agent	-	1.5 g/kg BW

*BW = body weight

Control concentration-time of AFB1 in plasma

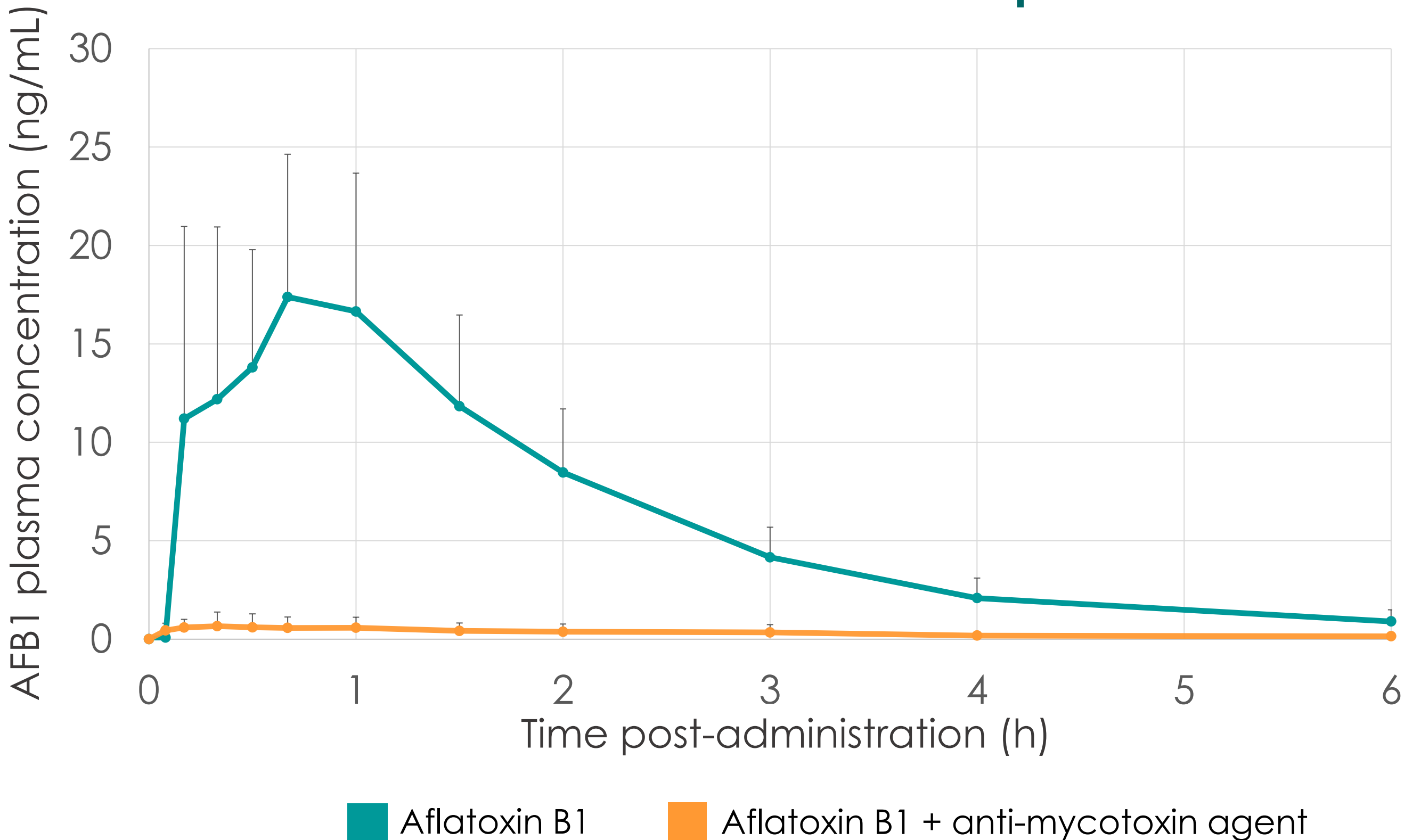


Calculation of the exposure of the piglets to the aflatoxin B1:

- Area under curve from time 0 to 6h ($AUC_{0\rightarrow6}$)
- Maximum plasma concentration (C_{max})
- Time at maximum plasma concentration (T_{max})
- Elimination half-time ($T_{1/2el}$)
- Elimination rate constant (K_e)
- Relative oral bioavailability
 $((AUC_{0\rightarrow6} AFB1 + AMA / AUC_{0\rightarrow6} AFB1) * 100)$

RESULTS

Plasma concentration-time profile



Toxicokinetic parameters

Toxicokinetic parameter	Aflatoxin B1	Aflatoxin B1 + anti-mycotoxin agent
$AUC_{0\rightarrow6h}$ (h.ng/mL)	36.68 ± 9.85	1.90 ± 1.95
C_{max} (ng/ml)	21.69 ± 7.62	0.80 ± 0.68
T_{max} (h)	0.67 ± 0.32	0.43 ± 0.37
$T_{1/2el}$ (h)	1.36 ± 0.76	3.38 ± 3.59
K_e (1/h)	0.62 ± 0.26	0.32 ± 0.15
Relative F (%)	/	5.37 ± 5.63

*Values in bold indicate a statistically significant difference ($p < 0.05$).

CONCLUSIONS

The anti-mycotoxins agent containing minerals adsorbents, natural phytochemicals and yeast products, is highly efficient in reducing total systematic exposure to aflatoxin B1 in pigs.