

# Carry-over of ochratoxin A and $\alpha$ in plasma, serum, milk, urine and faeces in lactating cows fed with concentrate-rich diets

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## Introduction

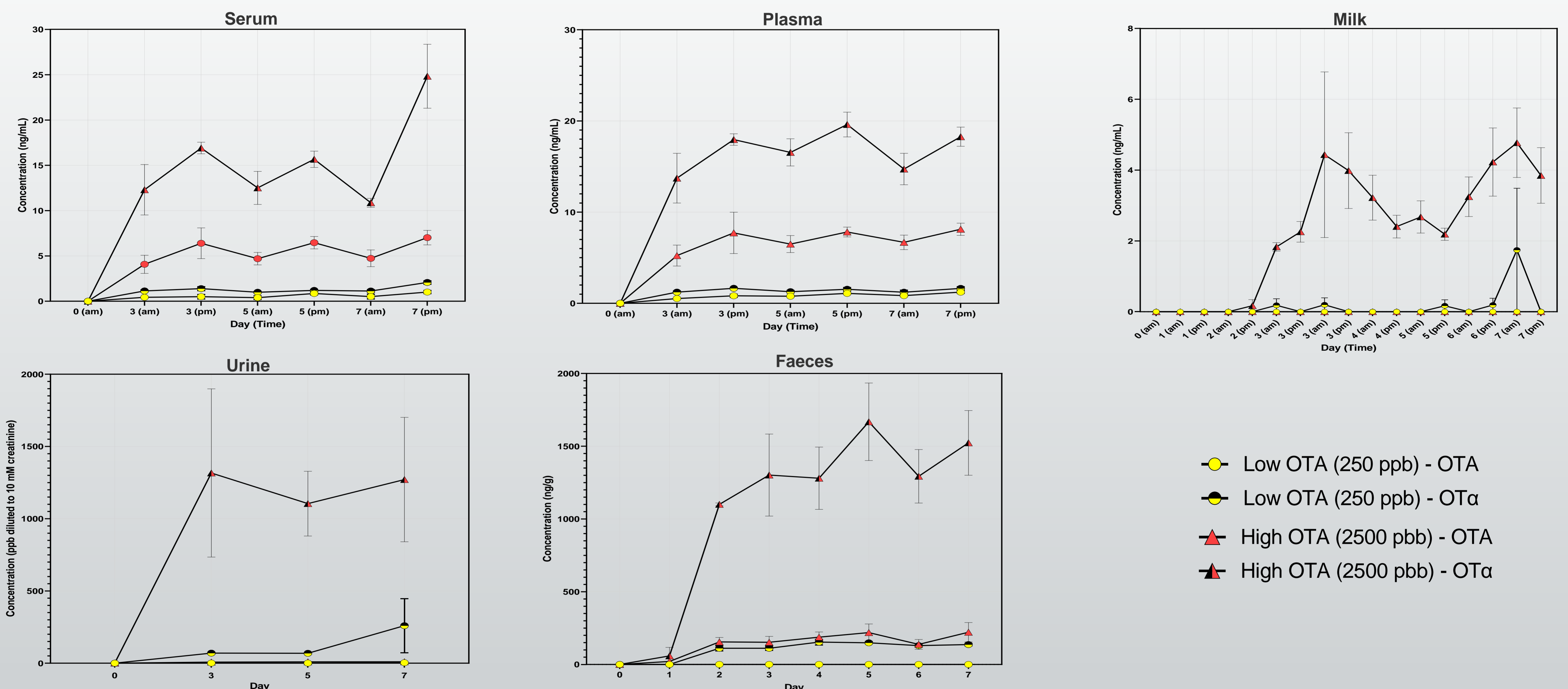
Ochratoxin (OT) A is a toxin produced by several species of fungi, including *Aspergillus* and *Penicillium*, and can contaminate various food and feedstuffs. Its hepatotoxic, nephrotoxic and teratogenic effects in animals are well documented. Ruminants possess physiological (i.e., microbial) systems for mycotoxins' detoxification. This experiment aimed to investigate the carry-over of OTA and its main metabolite OT $\alpha$  into plasma, serum, milk, urine and faeces in lactating Simmental cows fed with concentrate-rich-diets.

## Methods

Simmental cows fed with concentrate-rich-diets (containing grass silage, maize silage and concentrate at the proportions of 37.1%, 12.5% and 50.4% on dry matter basis, respectively). The cows (n=12) were divided in two groups (OTA-Low and OTA-High), which received 250 and 2500  $\mu\text{g}/\text{kg}$  DM day for 7 days, respectively. The carry-over in the mentioned matrices was measured via high performance liquid-chromatography (HPLC).

In addition, daily feed intake, milk production and clinical parameters were daily evaluated. Milk composition, haematological parameters and hepatic enzymes were evaluated the days 0 and 7 of the experiment.

## Results



Using three cows per group, the analytical method was validated by determining the following limit of quantification (LOQs) for OTA and OT $\alpha$ : In plasma, serum, and milk 0.5 ng/mL, urine diluted to 10 mM creatinine 5 ppb and in dried faeces 50 ng/g. All stated LOQs are applicable for both analytes. On day 7, the average ( $\pm$  SD) concentrations of OTA in plasma, serum, milk (ng/mL), urine (ppb diluted to 10 mM creatinine) and faeces (ng/g DM) in the group OTA-High were 8.1 ( $\pm$ 0.9), 7.0 ( $\pm$ 1.1), 0.0 ( $\pm$ 0.0), 9.9 ( $\pm$ 3.2), 222 ( $\pm$ 94.3), respectively, and for OT $\alpha$ , 18.3 ( $\pm$ 1.5), 24.8 ( $\pm$ 5.0), 4.8 ( $\pm$ 1.4), 1271 ( $\pm$ 609), 1523 ( $\pm$ 314), respectively.

## Conclusions

Taken together, ingesting concentrate-rich diets containing up to 2500  $\mu\text{g}$  OTA/kg DM for seven days did not affect feed intake, milk production and composition, chewing behaviour, clinical and haematological parameters, or hepatic function of cows. Because most OTA was microbially metabolized, low concentrations were detected in plasma/serum, and carry-over into milk was not detected. The excretion was mainly as OT $\alpha$  in urine and faeces.

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