

Evaluation of fermented whey and pumpkin as functional ingredients against aflatoxin B1 and ochratoxin A oral toxicity in rat duodenum

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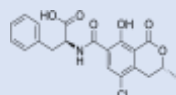
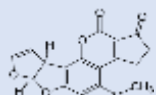
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Introduction

Aflatoxin B1 (AFB1) Ochratoxin A (OTA)

IARC – Group 1:
Carcinogenic to humans

IARC – Group 2B: Possibly
Carcinogenic to humans



Objective

This study aims to investigate the *in vivo* impact of AFB1 and OTA on gene expression in the duodenum of rats. Additionally, the study evaluates the preventive effects of fermented whey (FW) and pumpkin (P) bioactive ingredients.



Material and Methods

I. RNA Extraction and purification



II. cDNA synthesis and Real Time qPCR analysis

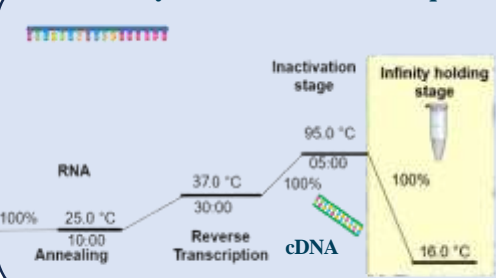


Table 1. Optimization parameters of the selected genes.

Gene	Anneling (°C)	Efficiency (%)	Linearity (R ²)
18S rRNA	60	111	0.993
p53	60	102	0.987
NF-κB	60	108	0.978
Bax	58	104	0.991
Hmox1	60	99	0.990
occludin	60	101	0.993

III. Statistical analysis



QuantStudio 5 Real Time PCR

The statistical analysis was performed using EXCEL software (2016). The median Log2RQ of all genes was calculated being Control and FW+P the reference groups.

Results and Discussion

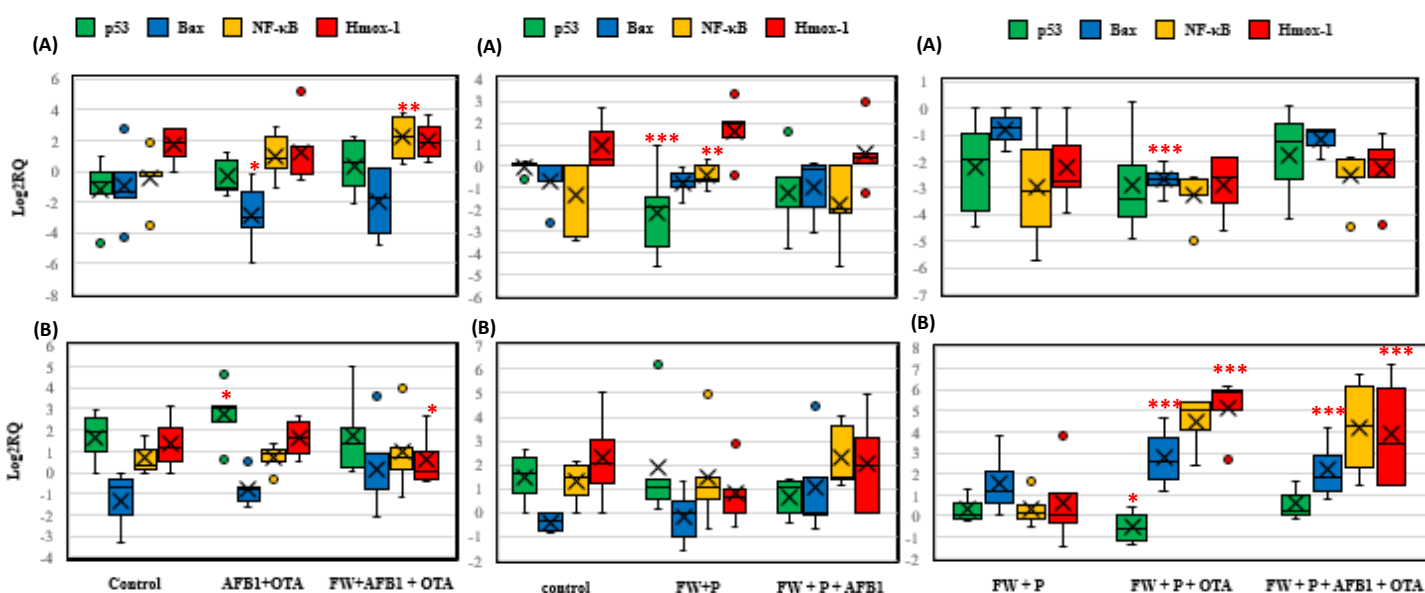


Figure 1. Box plots showing relative expression of apoptosis and cell cycle activity in rat duodenum male (A) and female (B) when compared to Controls.

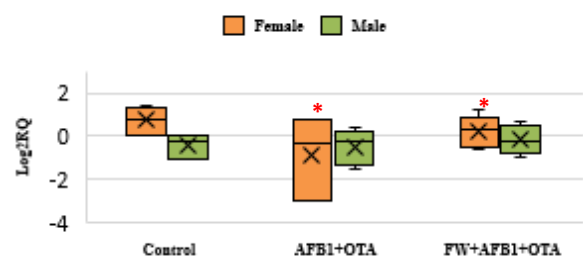


Figure 2. Box plots showing relative expression of occludin gene

Conclusion

Exposure to AFB1 and OTA disrupted apoptotic gene expression in both males and females, while occludin expression was affected only in females. The inclusion of bioactive ingredients exhibited protective effects in most cases, showing they are not sex-dependent.

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