EVALUATION OF THE EFFICACY OF AN ANTI-MYCOTOXIN AGENT IN MITIGATING THE ADVERSE EFFECTS OF ZEARALENONE IN PREPUBERTAL GILTS

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1. Introduction and Objective

Swine are recognized as **one of the most susceptible species** to the toxic effects of mycotoxins. **Zearalenone** (ZEN) is of concern due to its **estrogenic activity**. Sows are especially sensitive to this compound, which can d**isrupt reproductive physiology**, leading to **impaired fertility** and **decreased reproductive efficiency** (Wu et al., 2021). These reproductive disorders not only compromise **animal health** but also result in significant **economic losses** for the porcine industry due to reduced litter sizes and premature culling of breeding stock.

The aim of this study was to **evaluate** the **efficacy of an anti-mycotoxin agent (AMA)** that included **adsorbing material**, **turmeric (curcumin) extract**, **milk thistle (silymarin) extract**, and **yeast-derived components**, in **mitigating the adverse effects of ZEN** in **prepubertal gilts**, **acting through adsorption**, **bioprotection**, and **postbiotic effect**.

2. Materials and Methods

EXPERIMENTAL DESIGN

64 prepubertal gilts (BW: 8.58 kg)
3 groups with 8 replicates per group
21-day trial
Feed and water *ad libitum*

BW: Body weight; **ZEN**: zearalenone

Controlled parameters:

Parameter	Sample frequency
Vulvar volume	Every 5 days
Reproductive tract morphometry	Assessed post-slaughter

EXPERIMENTAL GROUPS

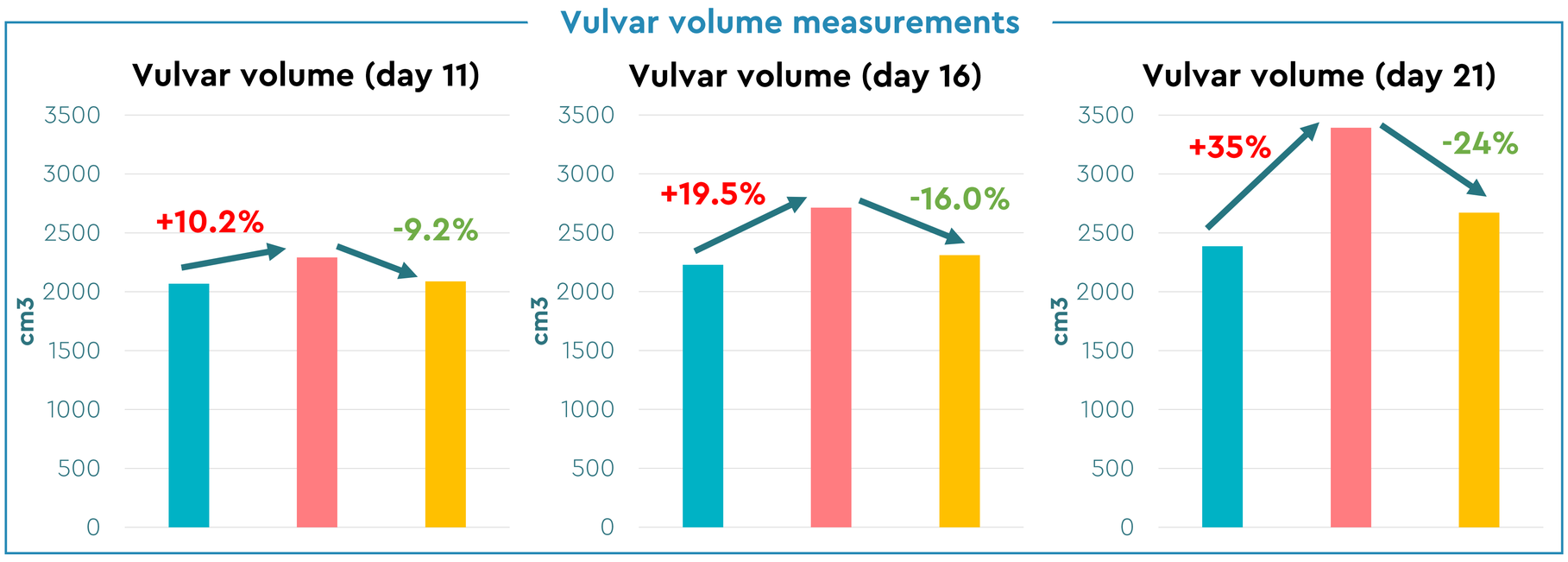
- **Control**
- **ZEN:** ZEN-exposed group (1.2 ppm)
- **ZEN + 5 kg/t AMA:** ZEN-exposed (1.2 ppm) group with anti-mycotoxin treatment

Summary/Key Points

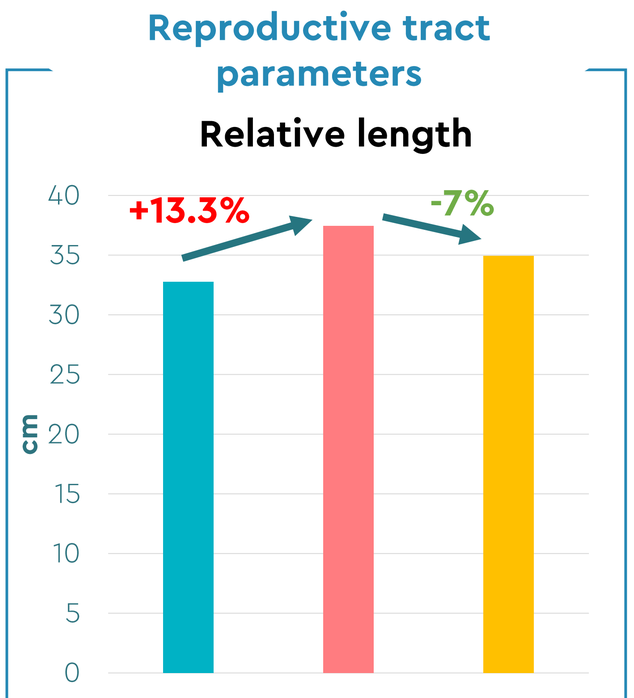
- **Zearalenone** (ZEN) at 1.2 ppm triggers severe **reproductive toxicity** in **prepubertal gilts**.
- The tested **anti-mycotoxin agent** acts through a synergistic blend of **adsorption, bioprotection** (curcumin and silymarin), and **postbiotic effects** to neutralize **ZEN-induced estrogenicity**.

3. Results and Discussion

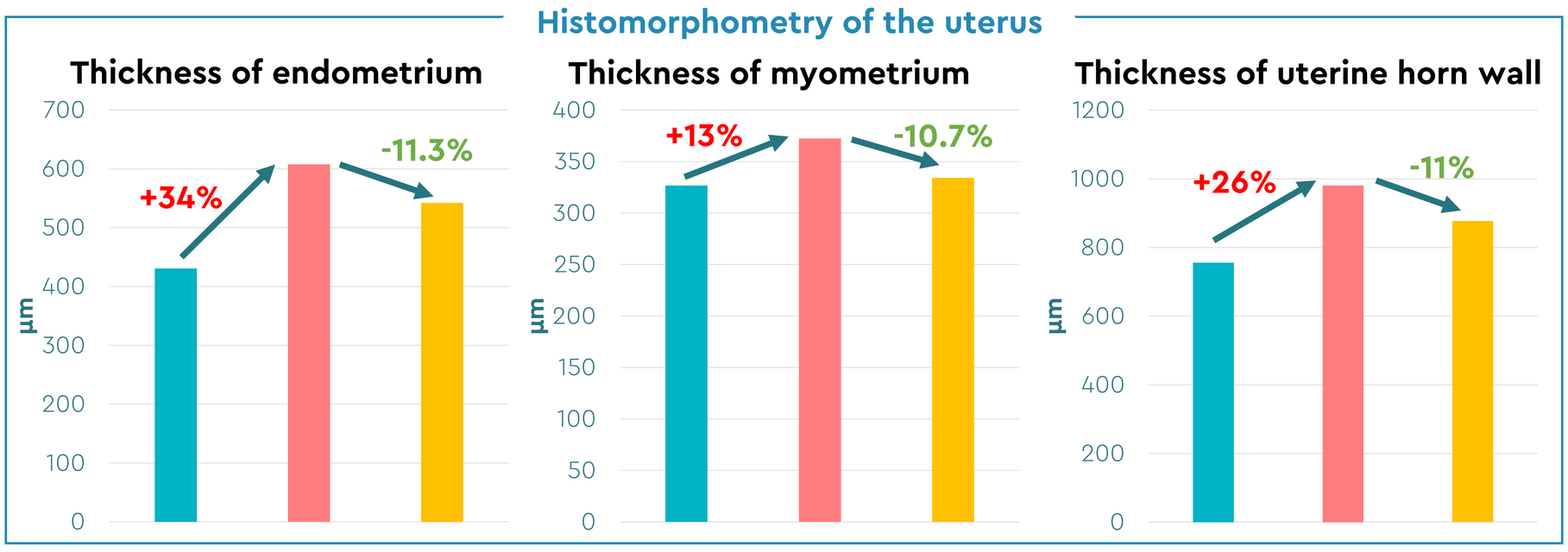
Vulvar volume measurements



Reproductive tract parameters



Histomorphometry of the uterus



ZEN exposure induced **estrogenic** and **hypertrophic effects** in **prepubertal gilts**, increasing **volume** (+1006.63 cm^3), **reproductive tract length** (+4.69 cm), and **relative tract weight** (+0.04%). The **AMA** significantly **alleviated these effects**, reducing vulvar volume (p = 0.0003) and relative tract weight (–0.02 %, p = 0.0016); while the decrease in tract length (–2.53 cm) was not statistically significant. Additionally, ZEN caused uterine hypertrophy, increasing endometrium (+176.66 µm), myometrium (+45.55 µm), and **total wall thickness** (+225.07 µm). The **AMA attenuated these alterations**: -65.49 µm, -38.08 µm, and -103.90 µm, respectively. Direct comparison between control and ZEN-exposed animals receiving anti-mycotoxin treatment showed **complete restoration of macroscopic estrogenic indicators** (vulvar swelling, tract length) alongside **partial mitigation of microscopic tissue changes**.

4. Conclusion

ZEN induced pronounced **estrogenic alterations** in prepubertal gilts, confirming the expected estrogenic activity. The **AMA at 5kg/ton** significantly **mitigated these effects**, confirming its **neutralizing efficacy against ZEN-induced reproductive toxicity**.

5. Acknowledgements and References

Wu, F., Cui, J., Yang, X., Liu, S., Han, S., & Chen, B. (2021). Effects of zearalenone on genital organ development, serum immunoglobulin, antioxidant capacity, sex hormones and liver function of prepubertal gilts. Toxicon, 189, 39–44. https://doi.org/10.1016/j.toxicon.2020.11.005

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