

EVALUATION OF THE EFFICACY OF A TURMERIC/SYLIMARIN-BASED ANTI-MYCOTOXIN AGENT IN MITIGATING THE NEGATIVE EFFECTS OF FUSARIUM MYCOTOXINS: AN *EX VIVO* TRIAL IN PORCINE ILEAL ORGANOID

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1. Introduction and Objective

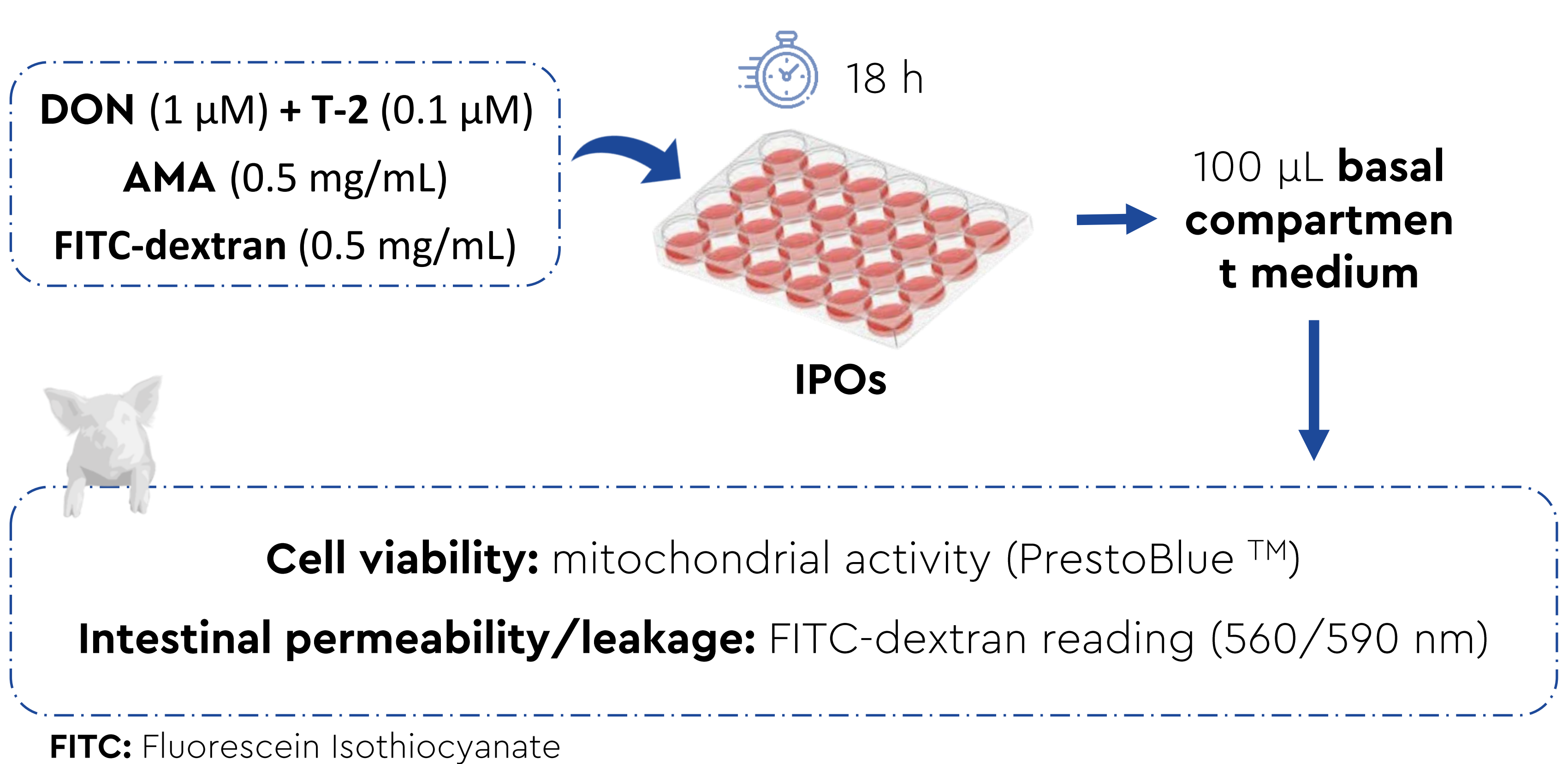
Intestinal cell layer integrity has been proven to be compromised by *Fusarium*-generated mycotoxins, such as **deoxynivalenol (DON)** and **T-2 toxin**, leading to an **increased susceptibility** of animals to **pathogens** and **toxicants**. The use of **natural plant extracts** is of current interest, given their favorable health properties.

This study aims to evaluate the effectiveness of an **anti-mycotoxin agent (AMA)** containing **turmeric (*Curcuma longa*)** and **milk thistle (*Silybum marianum*)** extracts in **mitigating** the **detrimental effects** of **DON** and **T-2** exposure in **ileal porcine organoids (IPOs)** monolayers within an *ex vivo* model (Kolf-Clauw et al., 2009; Pomothy et al., 2020).

Summary/Key Points

- Use of **IPOs** to simulate **toxin damage**.
- An **anti-mycotoxin agent (AMA)** containing turmeric and milk thistle extracts **increased mitochondrial activity** and **reduced intestinal permeability**.

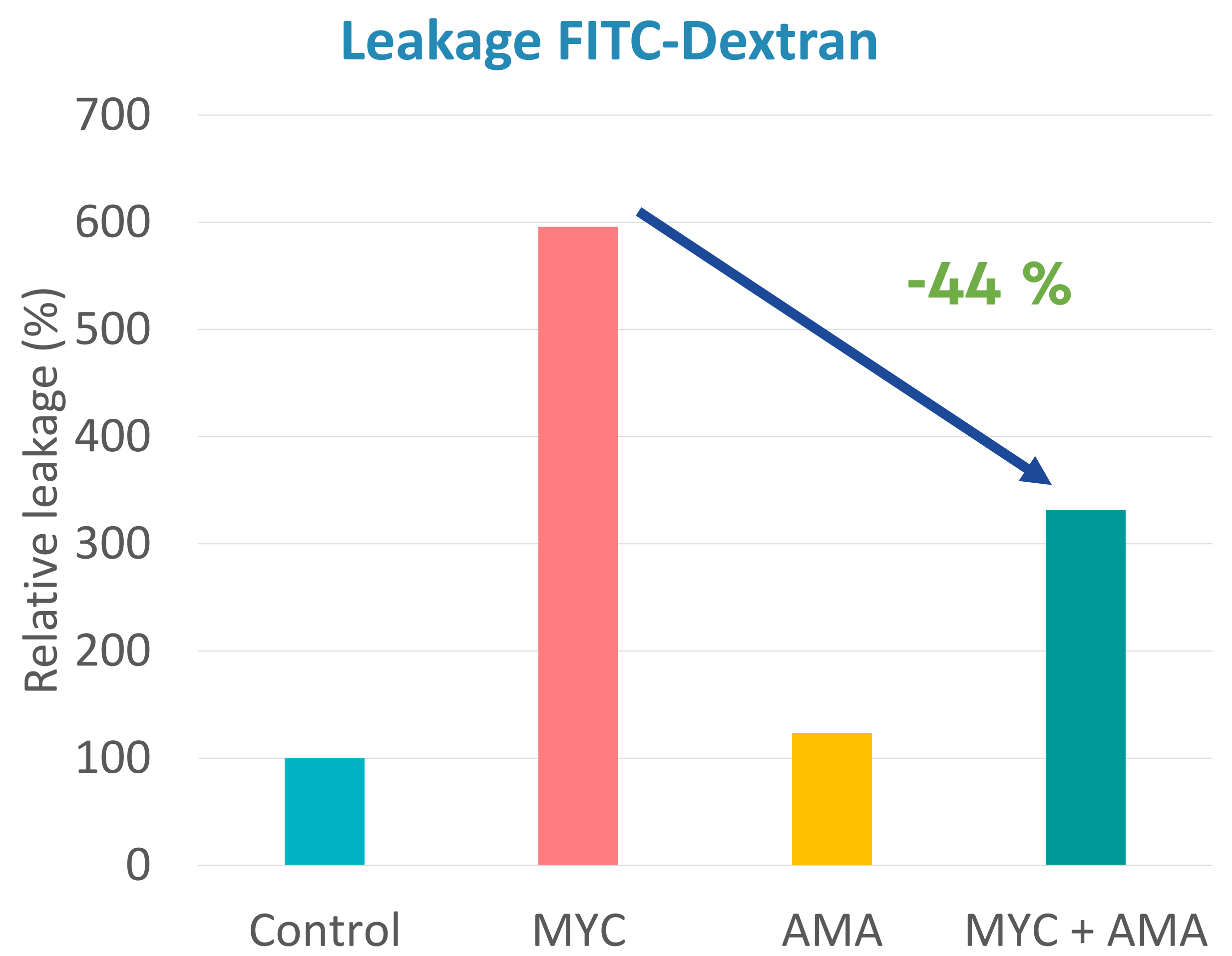
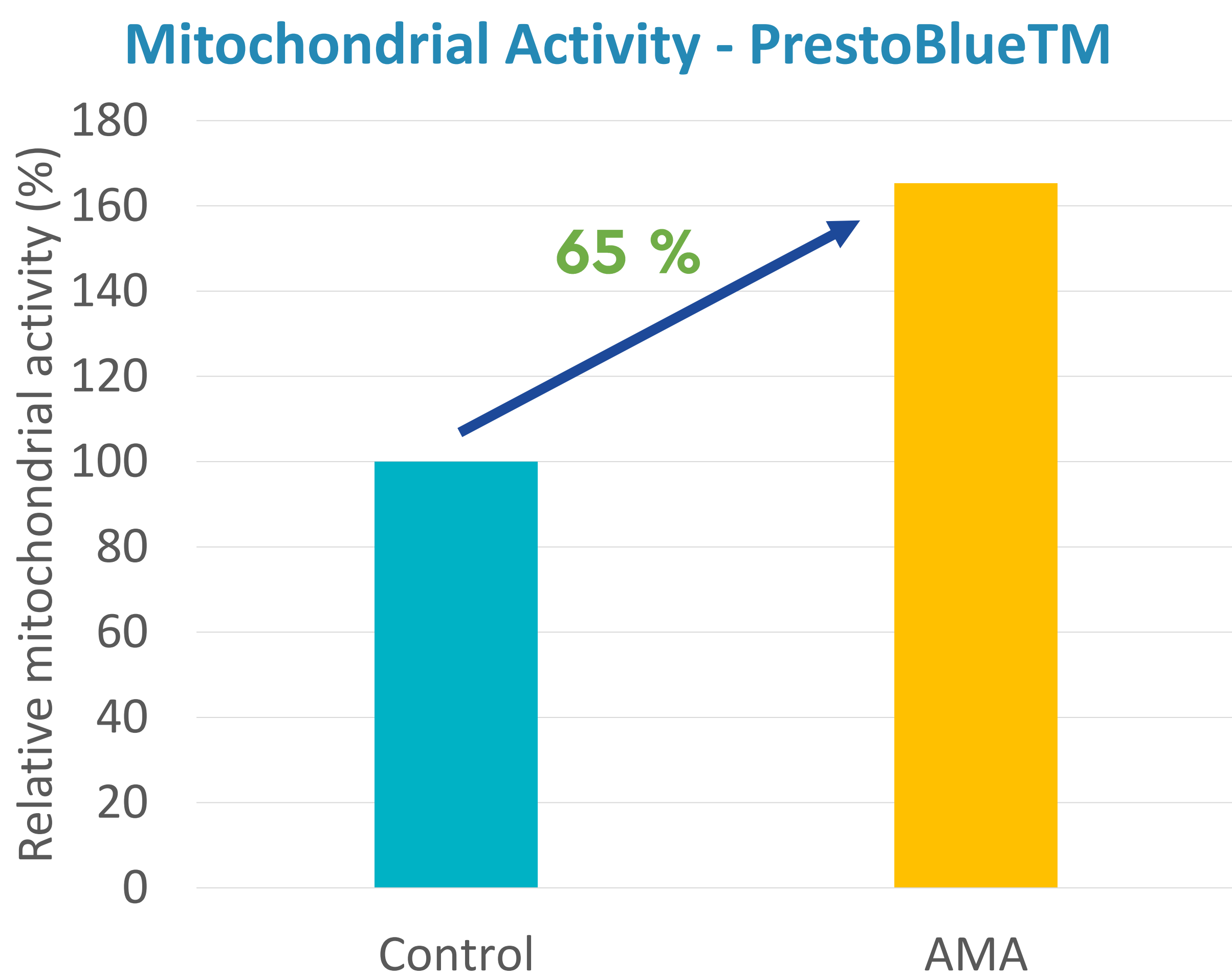
2. Materials and Methods



Groups	DON + T-2	AMA	FITC-dextran
Control	No	No	Yes
MYC	Yes	No	Yes
AMA	No	Yes	Yes
MYC + AMA	Yes	Yes	Yes

MYC: mycotoxins

3. Results and Discussion



The results demonstrated that the presence of **AMA** resulted in **enhanced mitochondrial activity values** (+65%), which led to **improved cell viability** when compared with the control group ($p \leq 0.05$). The significantly increased permeability of FITC-dextran ($p < 0.05$) in the DON/T-2 contaminated medium was indicative of leakage. However, the **permeability of the medium** was found to be **significantly reduced** by the addition of **AMA**, with a marked decrease of **-44%** ($p < 0.05$).

4. Conclusion

The use of an **AMA** with **turmeric (*Curcuma longa*)** and **milk thistle (*Silybum marianum*)** natural extracts in its composition resulted in **enhanced cellular viability** and **reduced intestinal permeability** on mycotoxin-challenged porcine ileal organoids. The reduction of the negative effects caused by these mycotoxins could lead to **increased animal growth**, **enhancement of the immune system** and **overall boosted health**.

5. Acknowledgements and References

Kolf-Clauw M, Castellote J, Joly B, Bourges-Abella N, Raymond-Letron I, Pinton P, Oswald I (2009). Development of a pig jejunal explant culture for studying the gastrointestinal toxicity of the mycotoxin deoxynivalenol: Histopathological analysis. *Toxicology in Vitro*, 8, 1580-1584. <https://doi.org/10.1016/j.tiv.2009.07.015>

Pomothy J, Barna R, Pászti E, Babiczky Á, Szóládi Á, Jerzsele Á, Gere E (2020). Beneficial Effects of Rosmarinic Acid on IPEC-J2 Cells Exposed to the Combination of Deoxynivalenol and T-2 Toxin. *Mediators of Inflammation*, 2020. <https://doi.org/10.1155/2020/8880651>

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