

MATERNAL FRUCTOSE INTAKE WORSENS THE DETRIMENTAL EFFECTS OF TAGATOSE CONSUMPTION IN RAT MALE DESCENDANTS

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INTRODUCTION & AIM

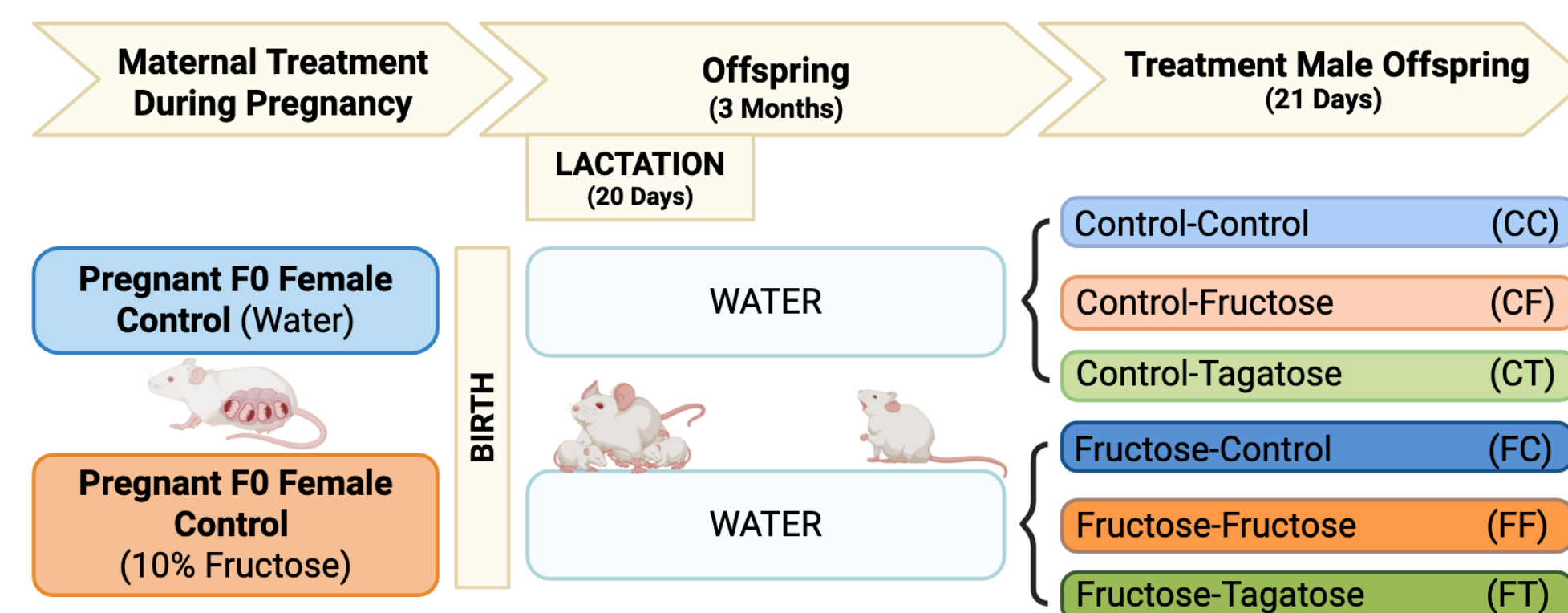
Maternal nutrition plays a crucial role in shaping long-term health outcomes for the offspring. We have previously shown that maternal fructose intake can trigger adverse effects in fetuses, which persist into adulthood. Despite these findings, fructose consumption is not contraindicated during pregnancy.

In contrast, low-caloric sweeteners such as tagatose are increasingly promoted as healthier alternatives worldwide.

Building on this context, we investigated whether tagatose consumption, compared to fructose, differently influences lipid metabolism in the offspring of mothers exposed to fructose during pregnancy.

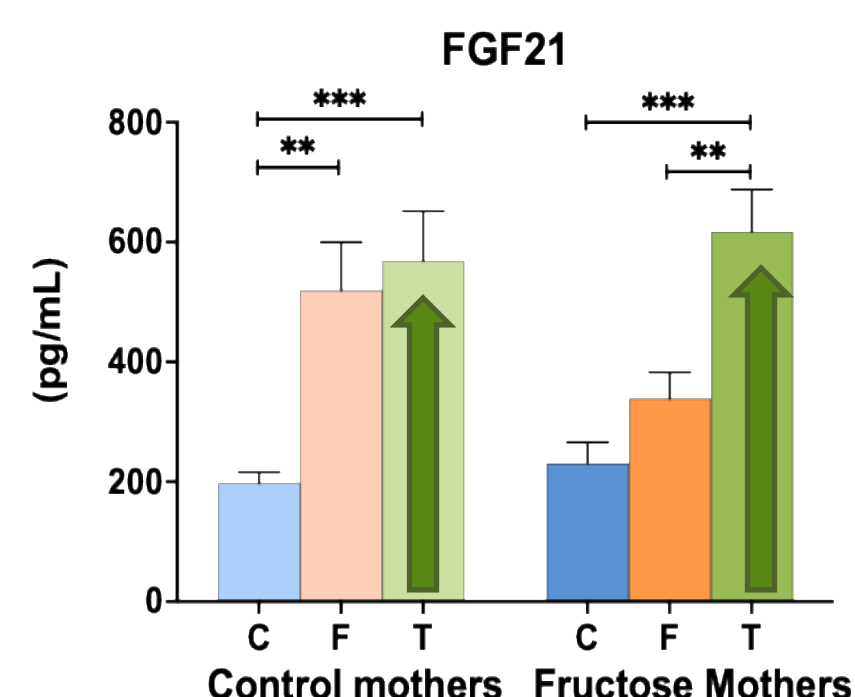
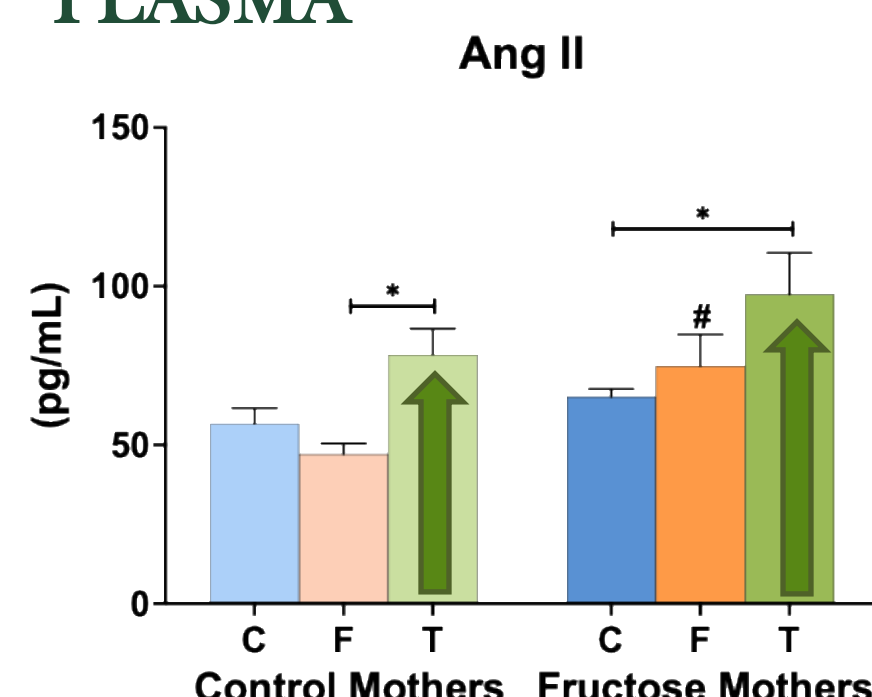
METHODS

Biochemical and molecular parameters were determined in plasma, tissues and feces.

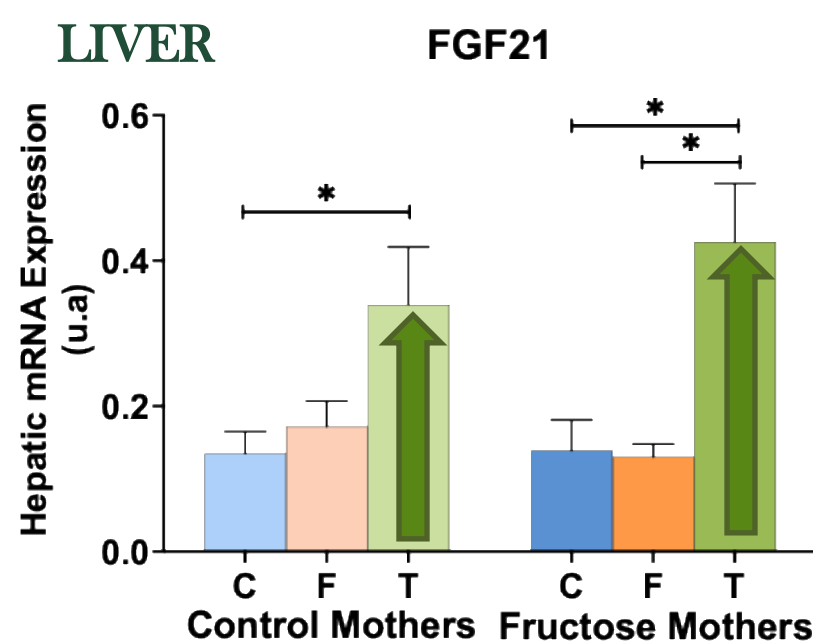


RESULTS & DISCUSSION

PLASMA

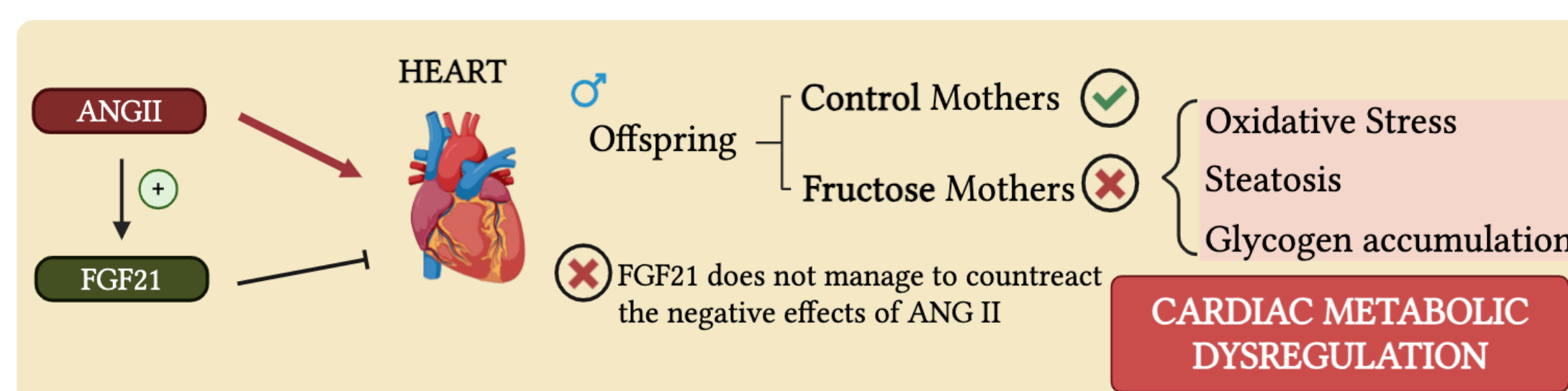


LIVER

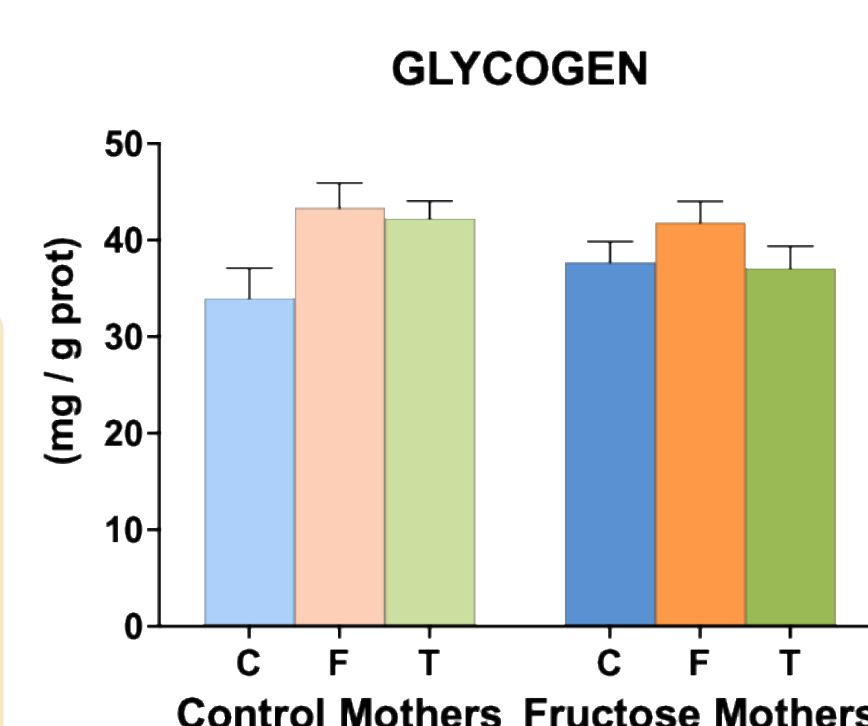
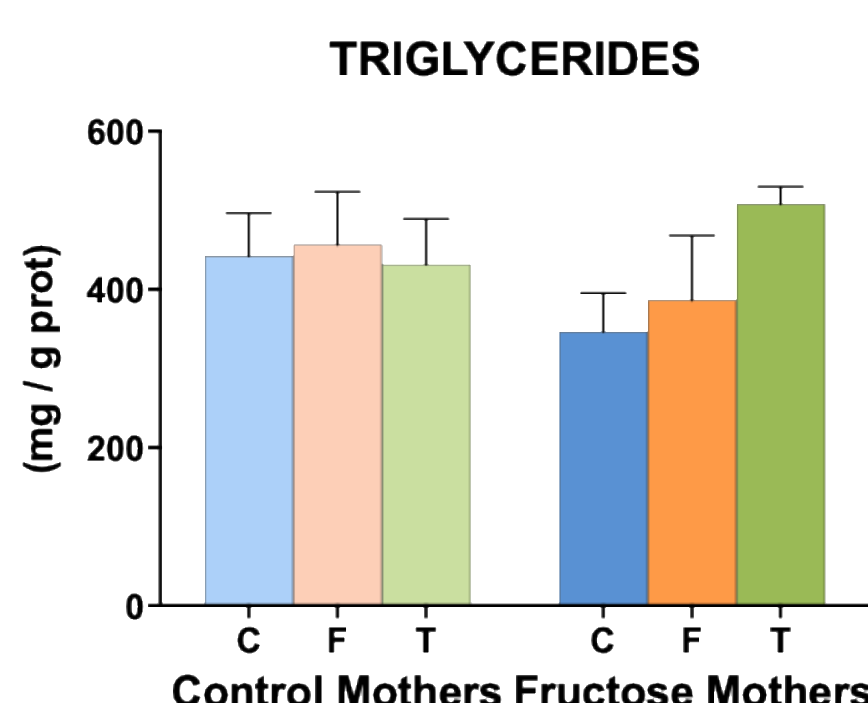
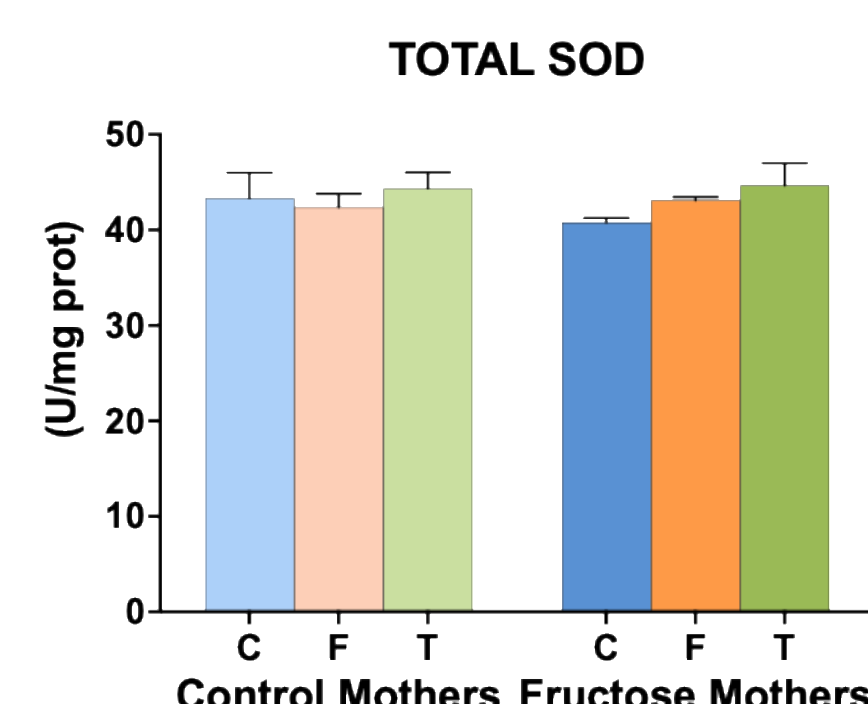


Tagatose intake produced an increase in plasma Angiotensin II (Ang II). This molecule promotes oxidative stress, steatosis and glycogen accumulation. It also increases serum FGF21 levels and hepatic FGF21 gene expression, which counteract the negative effects of AngII.

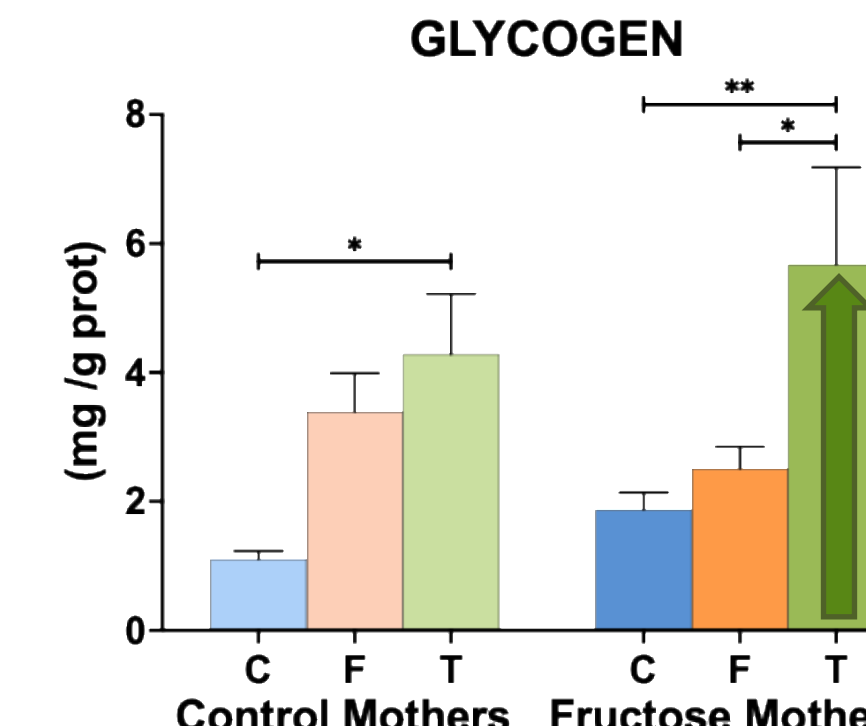
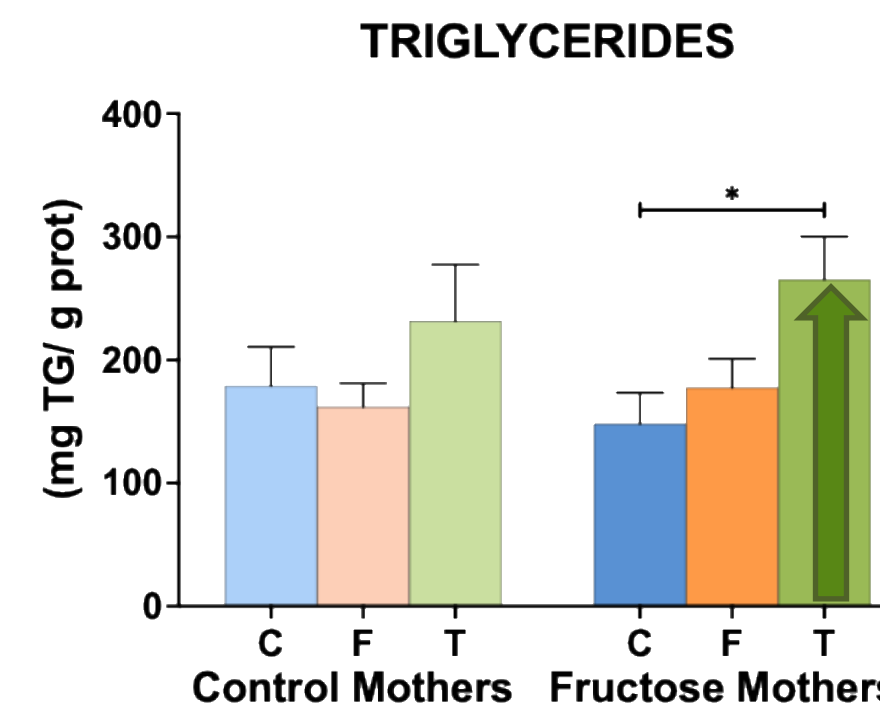
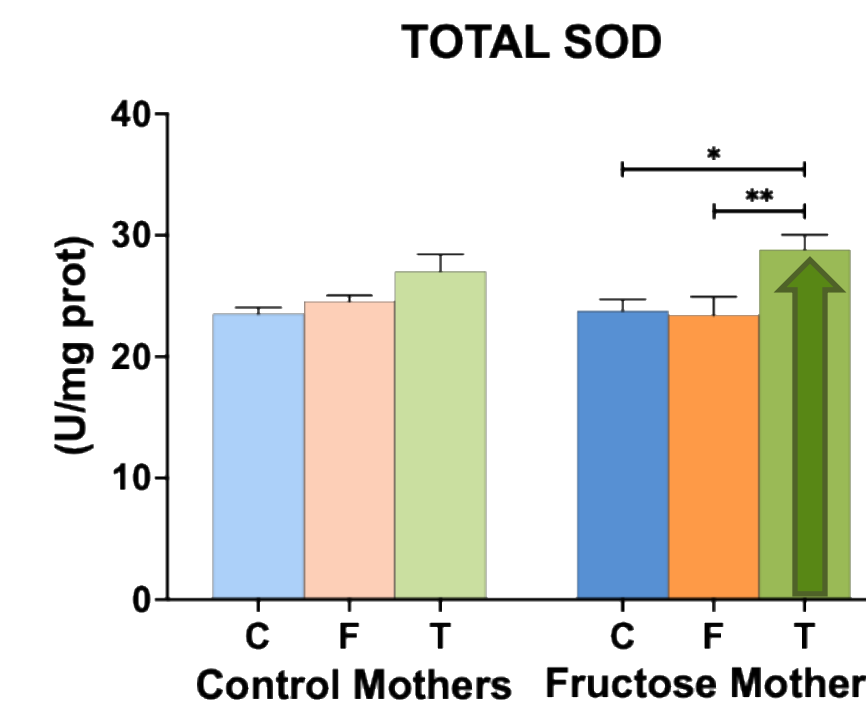
FGF21 effectively mitigates the adverse hepatic effects of Ang II in offspring consuming tagatose. However, in the hearts of male offspring from fructose-fed mothers, tagatose intake induced oxidative stress and the accumulation of glycogen and triglycerides. These alterations may represent early indicators of cardiac metabolic dysregulation, a condition frequently associated with diabetes and metabolic syndrome.



LIVER



HEART



CONCLUSION

Maternal fructose intake alters the offspring's metabolic response to tagatose consumption. Together with previous findings, these results reinforce the WHO recommendation to restrict simple sugar intake to less than 10% of total daily calories. Notably, the present study highlights that this guideline should also encompass rare sugars like tagatose.

REFERENCES & FUNDING

- Li S, et al. Fibroblast growth factor 21 protects the heart from angiotensin II-induced cardiac hypertrophy and dysfunction via SIRT1. *Biochim Biophys Acta Mol Basis Dis.* 2019;1865(6):1241–52.
- Varma U, et al. Molecular mechanisms of cardiac pathology in diabetes-Experimental insights. *Biochimica et Biophysica Acta (BBA)-Molecular Basis of Disease.* 2018;1864(5):1949–59.

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