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Effects of nesfatin-1 on rainbow trout hunger satiety

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Introduction:

Nesfatin-1 is a newly discovered neuropeptide that is derived from a precursor peptide called nucleobindin-2 (NUCB-2), and is thought to play a role in hunger satiety in mammalian organisms. While much research regarding nesfatin-1 has been conducted in mammals, nesfatin-1 is a little-studied substance in non-mammalian organisms. Although not researched extensively in fish, research on nesfatin-1 in goldfish indicated high levels of nesfatin-1 mRNA expression in the liver cells during starvation periods.

Method:

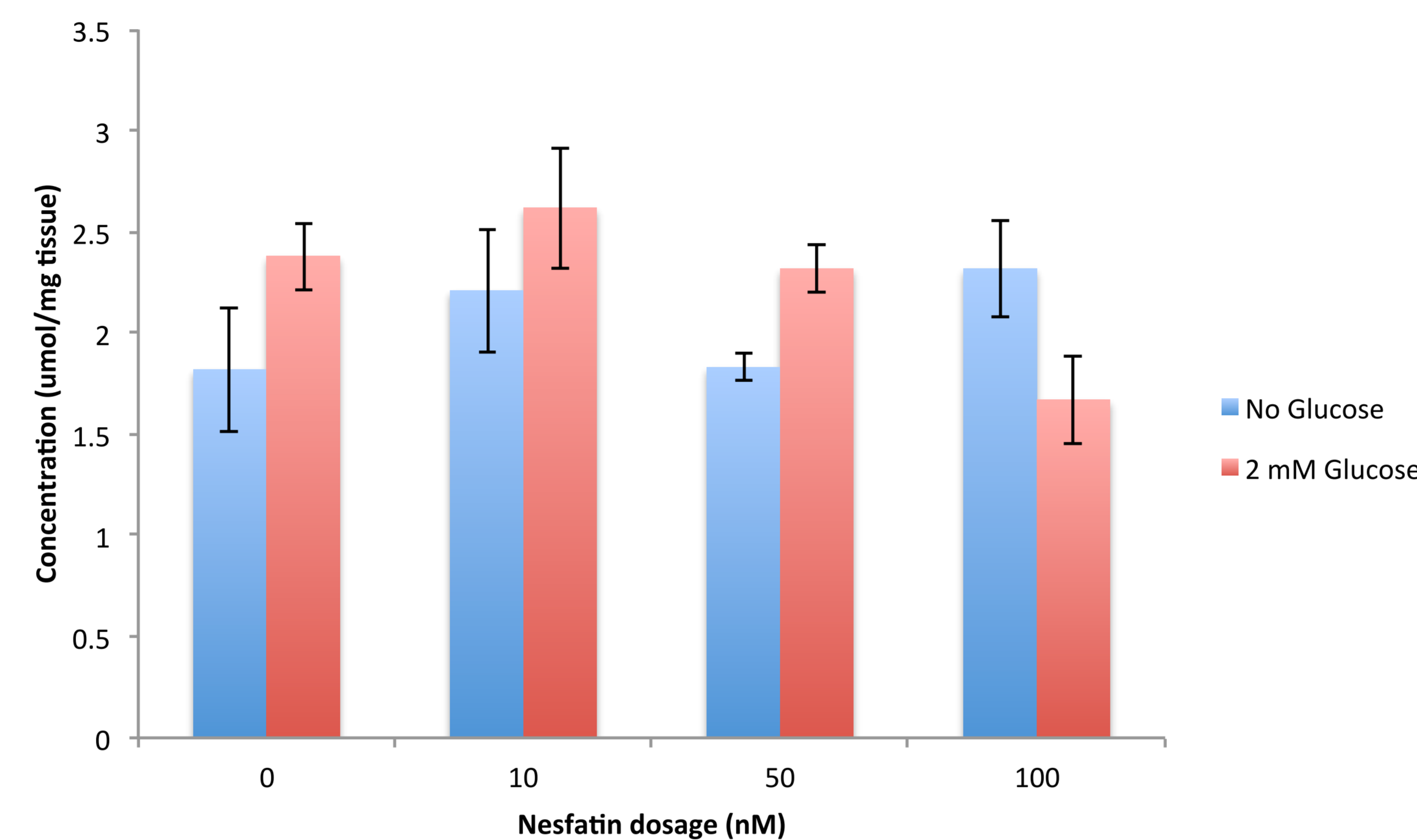
To study the effects of nesfatin-1 in teleost fish liver further, rainbow trout primary hepatocyte cultures were prepared and exposed to varying doses of nesfatin-1 (0 nM, 10 nM, 50 nM, and 100 nM) with or without glucose (2 mM) for 60 minutes. The cells were then analyzed for the amount of glycolytic and gluconeogenic activities through spectrophotometry. Levels of glucose and glycogen present in the various samples were measured to see the effects of nesfatin-1 on these activities in endpoint assays. Additionally, the enzymatic activities of pyruvate kinase and phosphoenolpyruvate carboxykinase (PEPCK) present in the cells were assessed using kinetic assays.

Conclusion:

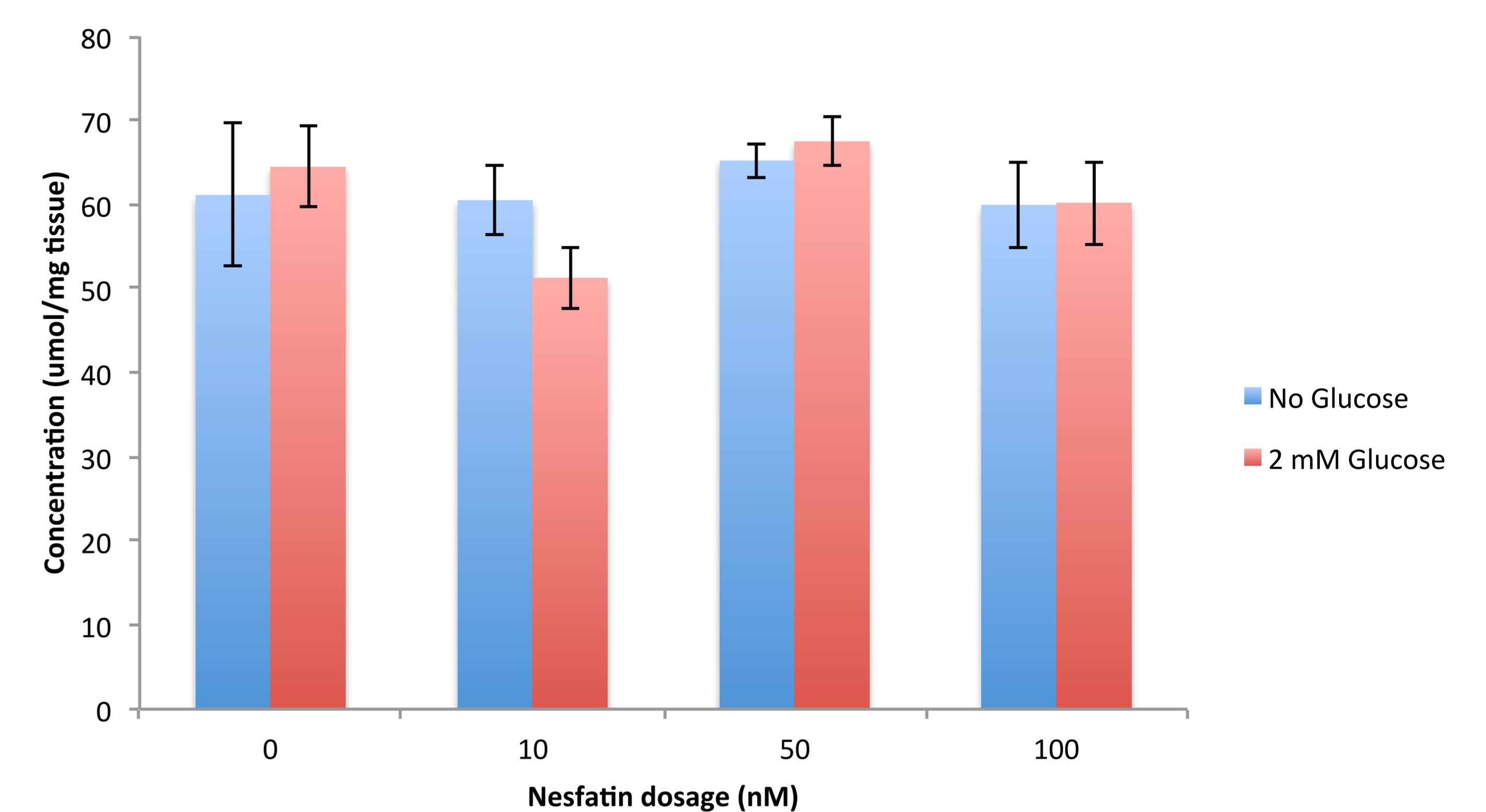
A trend towards decreased intracellular glucose concentration was observed under 100 nM dose of nesfatin-1 in the presence of 2 mM glucose, while no significance could be found at 10 nM and 50 nM doses of nesfatin-1. Overall, no conclusive evidence for a possible role of nesfatin-1 in affecting glucose metabolism in rainbow trout hepatocytes could be seen in this study. Further research will be required to validate these results.

Results:

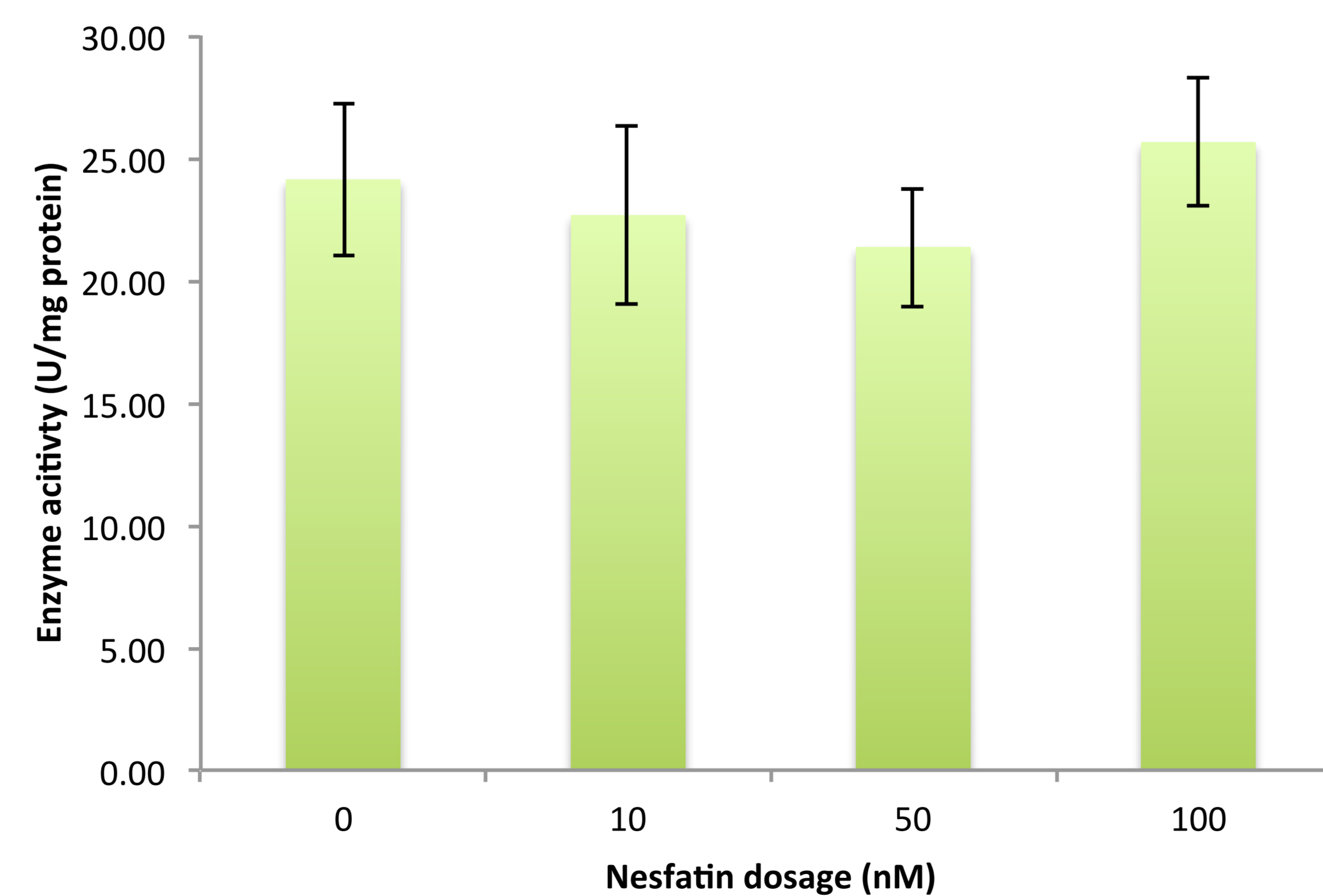
Comparison of [Glucose]



Comparison of [Glycogen]



Pyruvate kinase activity



PEPCK activity

