LABORATORY 8 – HORMONAL ACTIVITY: THE GLUCOSE TOLERANCE TEST

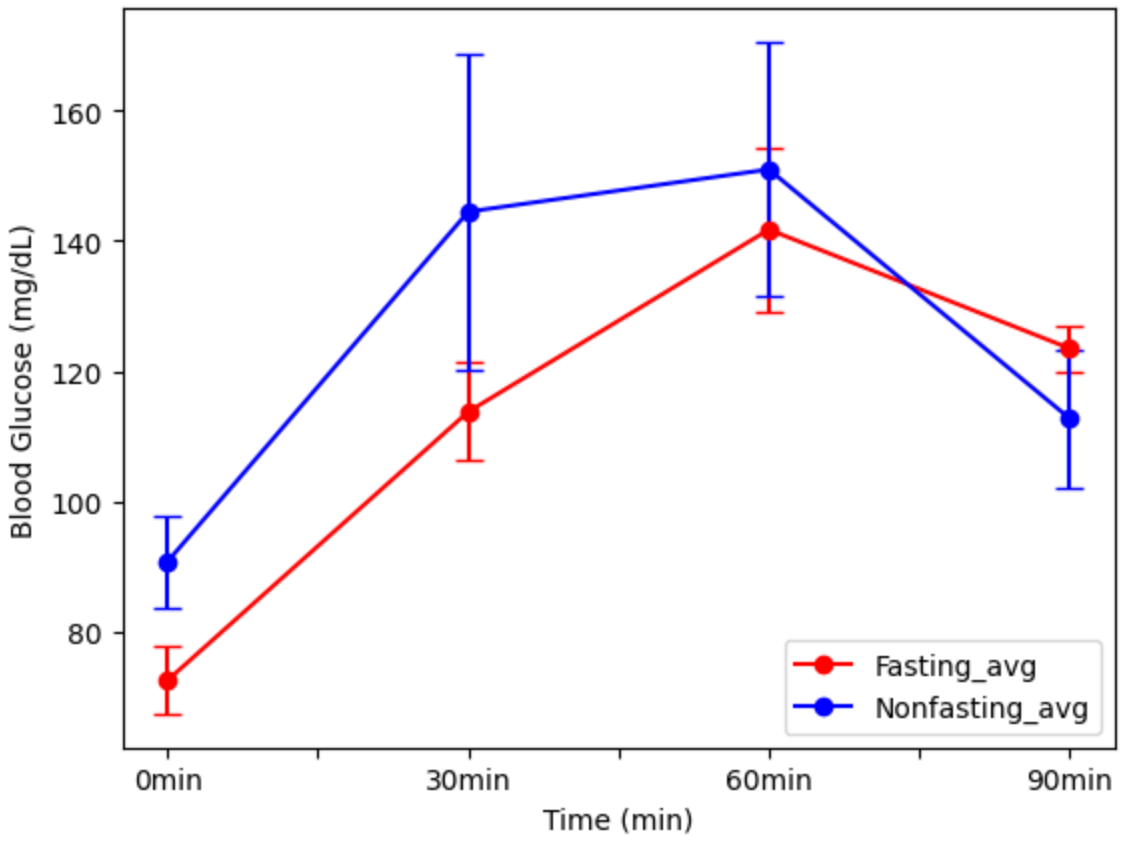
Purpose: The purpose of this laboratory experiment is to conduct a glucose tolerance test to assess the ability of the body, particularly the pancreas, to respond to an excess ingestion of glucose. This test is essential for diagnosing conditions such as diabetes mellitus and understanding the body's response to elevated glucose levels.

Procedure:

1. Six student volunteers will be selected for this experiment. These subjects should report to the lab in the fasted state – not having eaten for 10-12 hours.
2. Each student's normal fasting blood glucose level will be determined using the test strips for the glucometer assigned to each student. Each volunteer will clean a finger with 70% alcohol, then use a sterile lancet to obtain a drop of blood for the test. **If a student is helping another obtain a blood sample, gloves and universal precautions will be followed.
3. Each subject will then drink a lemon-flavored solution (Tru-Glu) of 25% glucose. The quantity of solution will be based on 1 g of glucose per kilogram of body weight. To determine body weight in kilograms, the weight in pounds will be divided by 2.2.
4. After ingesting the glucose, the subject will repeat the blood testing procedures every 30 minutes. Testing will continue in this manner for 1 1/2 hours or until the end of the lab period.
5. Record and graph the average of the class results of the blood glucose tests.
6. Compare the results with the normal glucose tolerance test curve. Describe the graphs in terms of absorptive and postabsorptive states.

Results:

Group	1 Fasting	2 Fasting	3 Fasting	4 Fasting	5 nonfasting	6_nonfasting	7_nonfasting	8_nonfasting	**Fasting_avg**	**Fasting_sem**	**Nonfasting_avg**	**Nonfasting_sem**
0min	**72**	**59**	**75**	**84**	**86**	**101**	**103**	**73**	72.5	5.172040216	90.75	7.028216938
30min	**95**	**113**	**132**	**115**	**203**	**159**	**127**	**89**	113.75	7.564996145	144.5	24.18505048
60min	**115**	**136**	**176**	**140**	**208**	**122**	**129**	**145**	141.75	12.66474766	151	19.60017007
90min	**118**	**118**	**133**	**125**	**82**	**119**	**119**	**131**	123.5	3.570714214	112.75	10.63308516



Discussion: The laboratory focuses on diagnosing diabetes mellitus, a condition characterized by high blood glucose levels and the excretion of glucose in the urine. Other common symptoms include increased urine output and excessive thirst. In severe cases, diabetes can lead to acidosis, coma, and death.To diagnose diabetes and assess glucose tolerance, various tests are employed. The glucose tolerance test involves the ingestion of a glucose solution, and blood glucose levels are monitored over time. Normal individuals typically experience a rise in blood glucose levels after glucose ingestion, followed by a return to normal levels within a few hours. In contrast, individuals with diabetes show prolonged hyperglycemia due to impaired pancreatic insulin secretion.

Conclusion: In conclusion, the glucose tolerance test is a valuable tool for diagnosing diabetes mellitus and evaluating the body's ability to respond to elevated glucose levels. It helps differentiate between normal glucose metabolism and abnormal responses,

particularly in individuals with diabetes. Understanding these responses is crucial for the management and treatment of diabetes, as well as for assessing overall metabolic health. This experiment underscores the significance of insulin in regulating blood glucose levels and the consequences of its deficiency or dysfunction, such as hyperglycemia and its associated symptoms.