Date ....   Name ....   Group ....

Lab report from the practical lesson on biochemistry

Topic: **Lipids, lipoproteins, examination of lipid metabolism**

Task 1: Hydrolytic cleavage of fat with pancreatic lipase

Principle:

Results:

Test tube:	Time	Consumption of NaOH 0.02 mol/l (ml)
Blank	0	
1	20 min	
2	40 min	
3	60 min	
3D	60 min	

Evaluation:
Create a simple graph to show the course of hydrolysis of milk fat. Plot the time (min.) on the x axis and the consumption of NaOH 0.02 mol/l (ml) on the y axis:
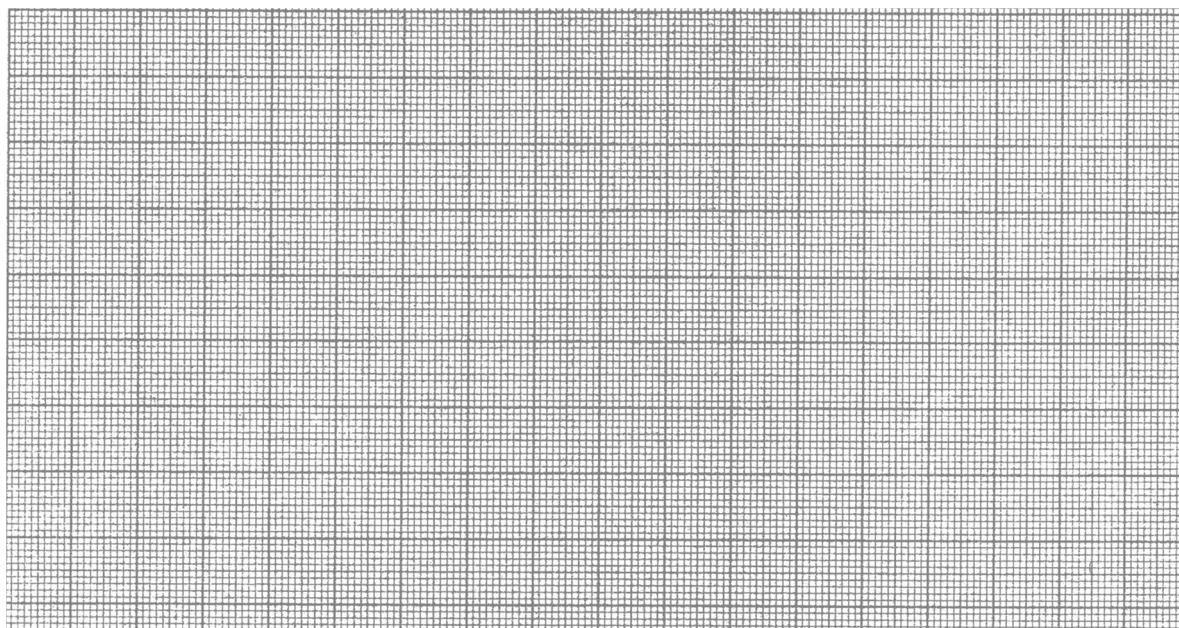
Conclusion:
Explain the increasing consumption of NaOH 0.02 mol/l during the incubation and consider whether your experiment demonstrates a promoting effect of deoxycholate on fat digestion.

Task 2: Demonstration of unsaturated bonds in fatty acids

Principle:

Results:

	TEST TUBE 1 Palmitic acid	TEST TUBE 2 Oleic acid	TEST TUBE 3 Plant oil	TEST TUBE 4 Blank
Color with KMnO$_4$				

Conclusion:
Summarize the observed color changes and explain them.

Task 3: Estimation of malondialdehyde

Principle:

Results:

	TEST TUBE 1 Fresh oil	TEST TUBE 2 Expired oil	TEST TUBE 3 Blank
Color following heating with thiobarbituric acid			

Conclusion:
Compare the color intensity in all the test tubes and try to explain the results.

Task 4: Estimation of serum concentration of total and HDL cholesterol
Principle (reactions employed in the assay):

Results:

	TEST TUBE 1 Total cholesterol	TEST TUBE 2 HDL cholesterol	TEST TUBE 3 Standard	TEST TUBE 4 Blank
A_{500}				0

Calculation:

1. Concentration of total serum cholesterol:

$$\text{S-Total cholesterol (mmol/l)} = \frac{A_{\text{sample}}}{A_{\text{standard}}} \times c_{\text{standard}}$$

$$\text{S-Total cholesterol (mmol/l)} = \frac{\ldots\ldots}{\ldots\ldots} \times \ldots\ldots = $$

2. Concentration of HDL cholesterol:

$$\text{S-HDL cholesterol (mmol/l)} = \frac{A_{\text{supernatant}} \times 3}{A_{\text{standard}} \times 10} \times c_{\text{standard}}$$

$$\text{S-HDL cholesterol (mmol/l)} = \frac{\ldots\ldots\ldots}{\ldots\ldots\ldots} \times \ldots\ldots\ldots = $$

Conclusion:
Compare your result with reference range.

Task 5 Estimation of serum concentration of triacylglycerols

Principle (reactions employed in the assay):

Results:

	TEST TUBE 1 Serum sample	TEST TUBE 2 Standard	TEST TUBE 3 Blank
A_{540}			0

Calculation:

Concentration of triacylglycerols in serum:

$$\text{S-Triacylglycerols (mmol/l)} = \frac{A_{sample}}{A_{standard}} \times c_{standard}$$

$$\text{S-Triacylglycerols (mmol/l)} = \frac{\ldots\ldots}{\ldots\ldots} \times \ldots\ldots = $$

Conclusion:
Compare your result with reference range.

Task 6: Calculation of LDL cholesterol, atherogenic index, and non-HDL cholesterol

LDL cholesterol = Total cholesterol − HDL cholesterol − $\dfrac{\text{Triacylglycerol (mmol/l)}}{2.2}$
(mmol/l)　　　　　(mmol/l)　　　　　(mmol/l)

LDL cholesterol (mmol/l)　=　………….. − …………… − $\dfrac{……….}{2.2}$　=　…………

Atherogenic index = $\dfrac{\text{Total cholesterol (mmol/l)}}{\text{HDL cholesterol (mmol/l)}}$

Atherogenic index　=　………../………..　=　………………

Non-HDL cholesterol (mmol/l) = Total cholesterol (mmol/l) – HDL cholesterol (mmol/l)

Non-HDL cholesterol (mmol/l)　=　…………….. − …………… = ……………

Conclusion:
Summarize whether any of these calculated parameters indicate an increased risk of atherosclerosis and cardiovascular disease.