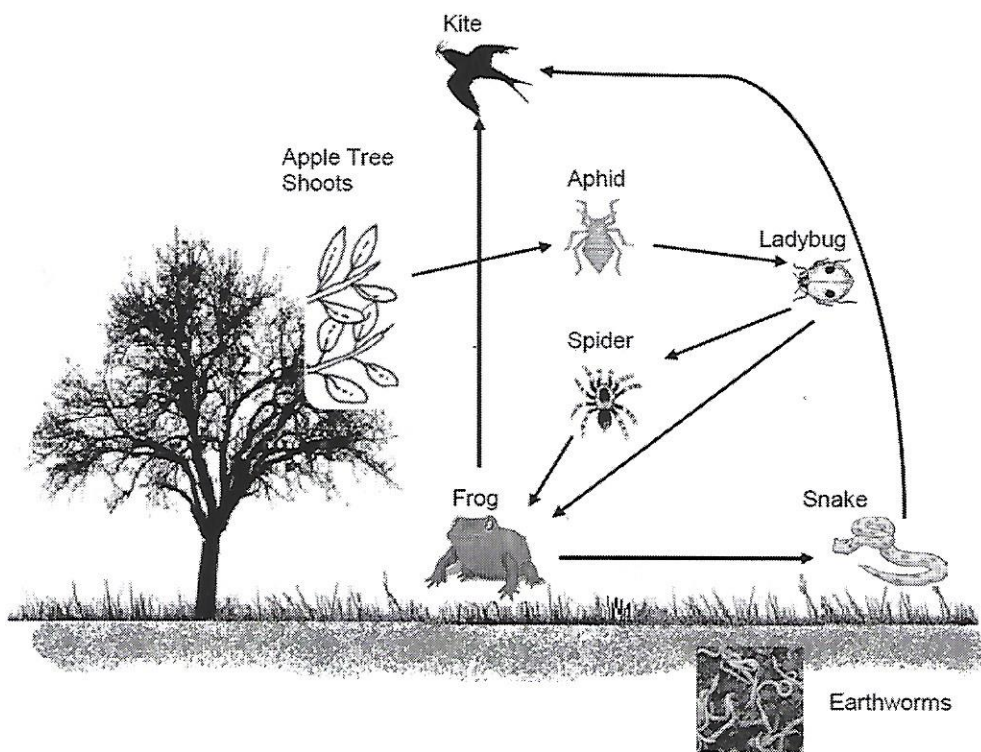


1. The following diagram shows the food web for an apple orchard ecosystem.

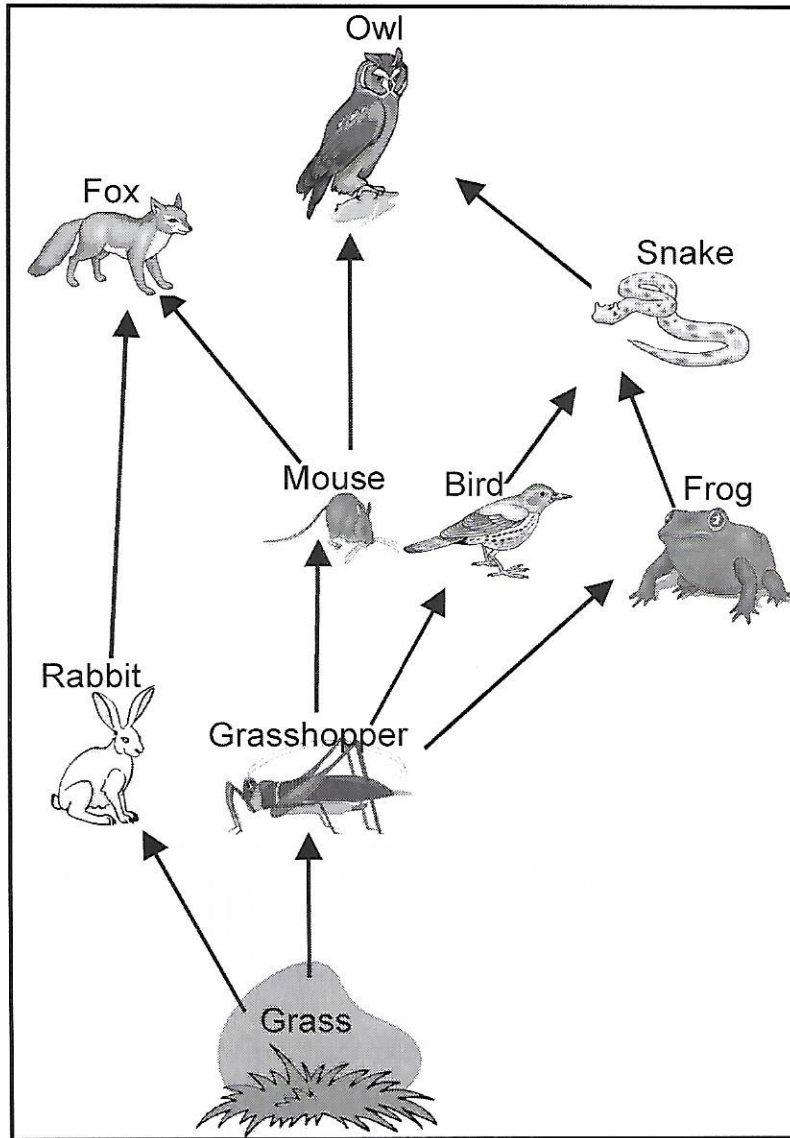
An Apple Orchard's Food Web



In the right-hand column of the table indicate an organism, from the food-web shown above, that belongs to the trophic level indicated in the left-hand column.

Trophic Level	Organism
Autotroph	apple tree shoots
Decomposer	earthworms
First-level consumer	aphid
Third-level consumer	spider

A Forest Food Web



An animal's habitat must be considered when determining the population density of an animal in a given area.

Which of the scenarios below represents an area in which the population density of the fox would be expected to increase?

↑ # foxes

↑ focus on key words

- A) Several years ago a disease resulted in the reduction of the vegetation in the forest. The forest has recovered and the vegetation has grown back. *↑ veggies = ↑ everything*
- B) There has been little rain in the forest. Some of the vegetation in the forest is unable to sustain its growth. *↓ everything*
- C) Due to natural population cycling and favourable weather conditions, the owl population has increased significantly over the past year. *↑ owls = ↓ mice = ↓ fox*
- D) A virus that affects rabbits has entered the ecosystem and the rabbit population has decreased significantly. *↓ rabbits = ↓ fox*

elk + wolves

3. Something Fishy

The grocer wants to promote the consumption of salmon because he knows about the health benefits of this fish.

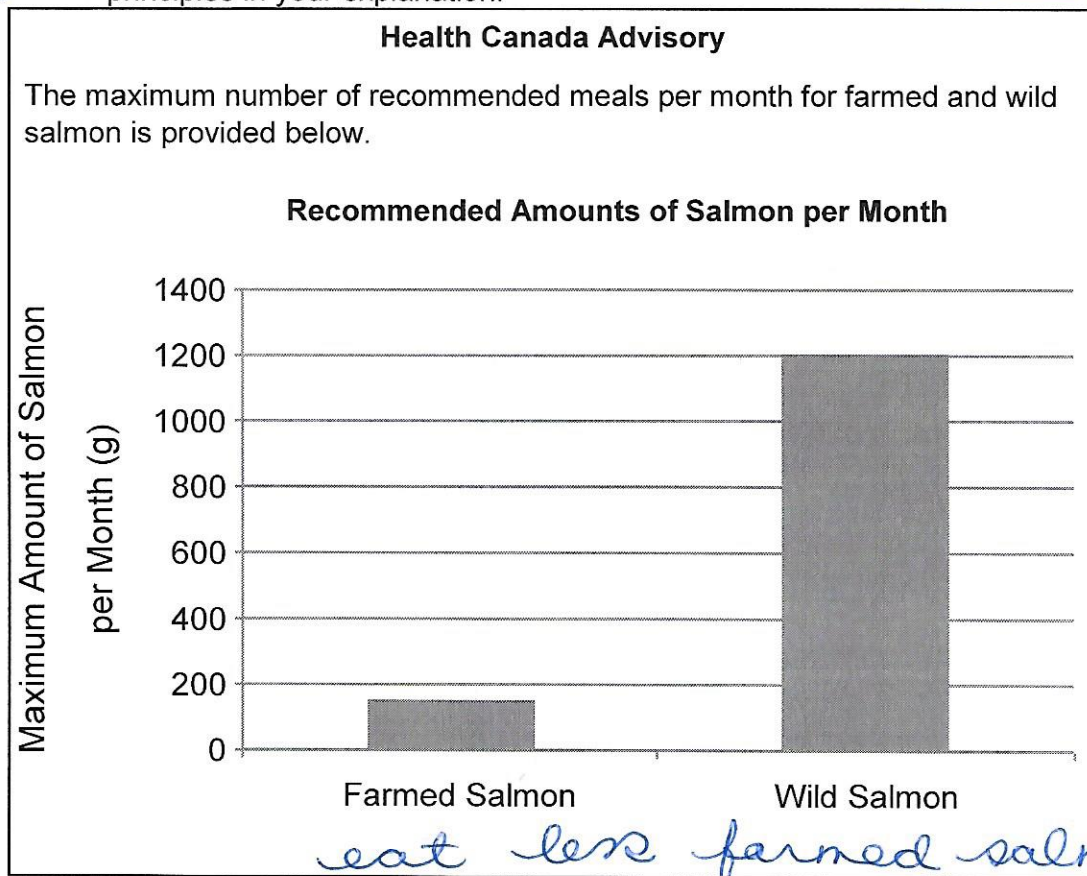
Salmon is also known to contain mercury (Hg), which is dangerous to human health. As a result, Health Canada has released recommendations on the maximum amount of salmon that should be consumed per month. These recommendations are different for farmed salmon and for wild salmon.

Your task is to:

not just describe

- Analyze the Health Canada Recommendations and Background information on mercury, farmed salmon and wild salmon.
- Explain why the recommendations for the maximum amount of salmon consumed per month are different for farmed salmon and wild salmon. Refer to established scientific principles in your explanation.

Questions
focus on key words



justify using science

Mercury Contamination in the Environment

Mercury is a highly toxic element that is found both naturally and as an industrial pollutant in the environment.

- Mercury falls from the air and can accumulate in streams and oceans where it is converted into methylmercury (CH₃Hg) by some types of bacteria in the water.

methyl group CH₃-

- These methylmercury (CH₃Hg)-containing bacteria may be consumed by the next higher level in the food chain, or the bacteria may excrete the methylmercury (CH₃Hg) into the water where it can quickly stick to plankton.
- Fish absorb the methylmercury (CH₃Hg) as they feed on organisms in these waters.

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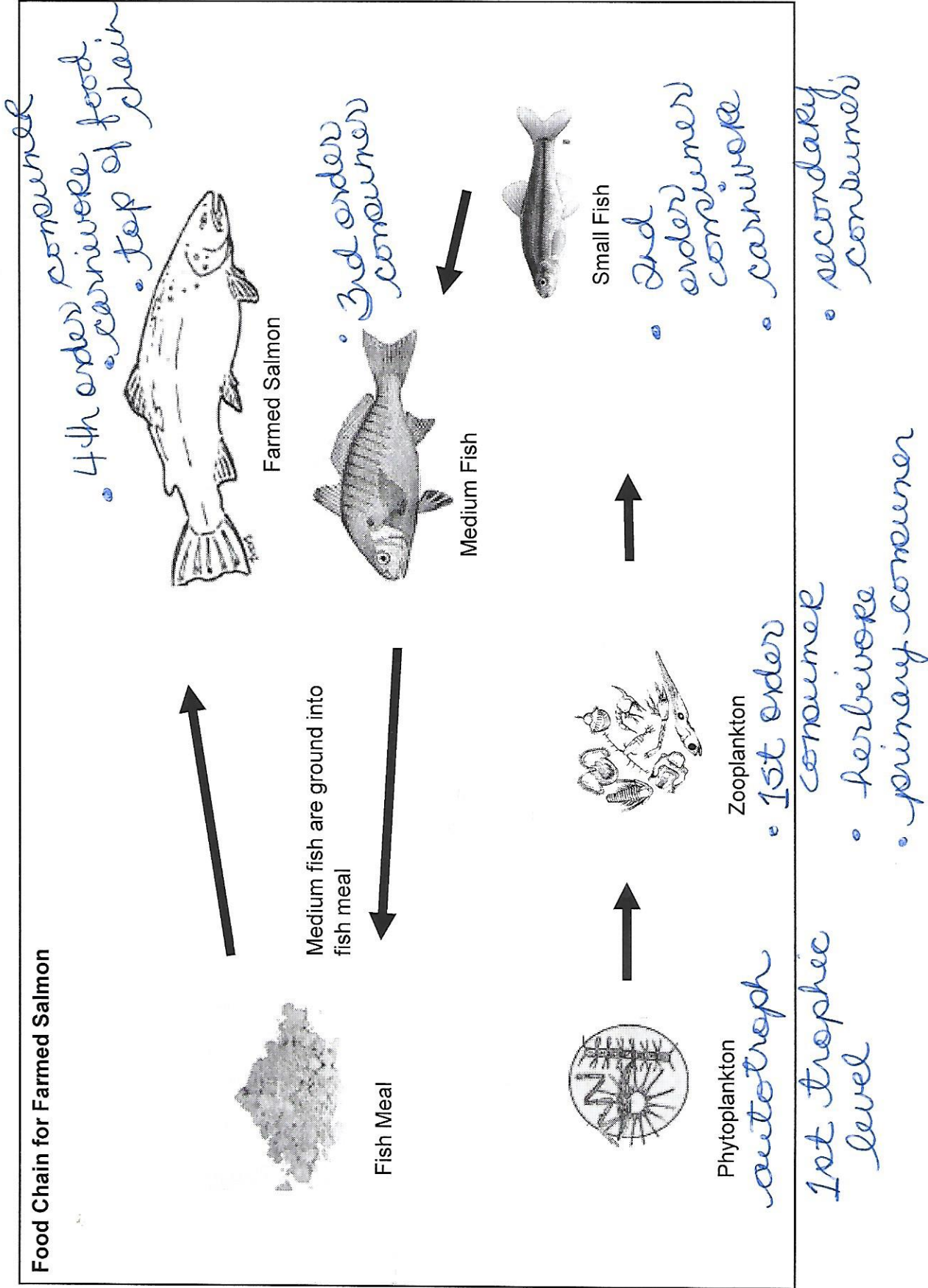
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Methylmercury (CH₃Hg) can accumulate in the fatty and muscle tissues of animals, including fish and human.

bioaccumulation

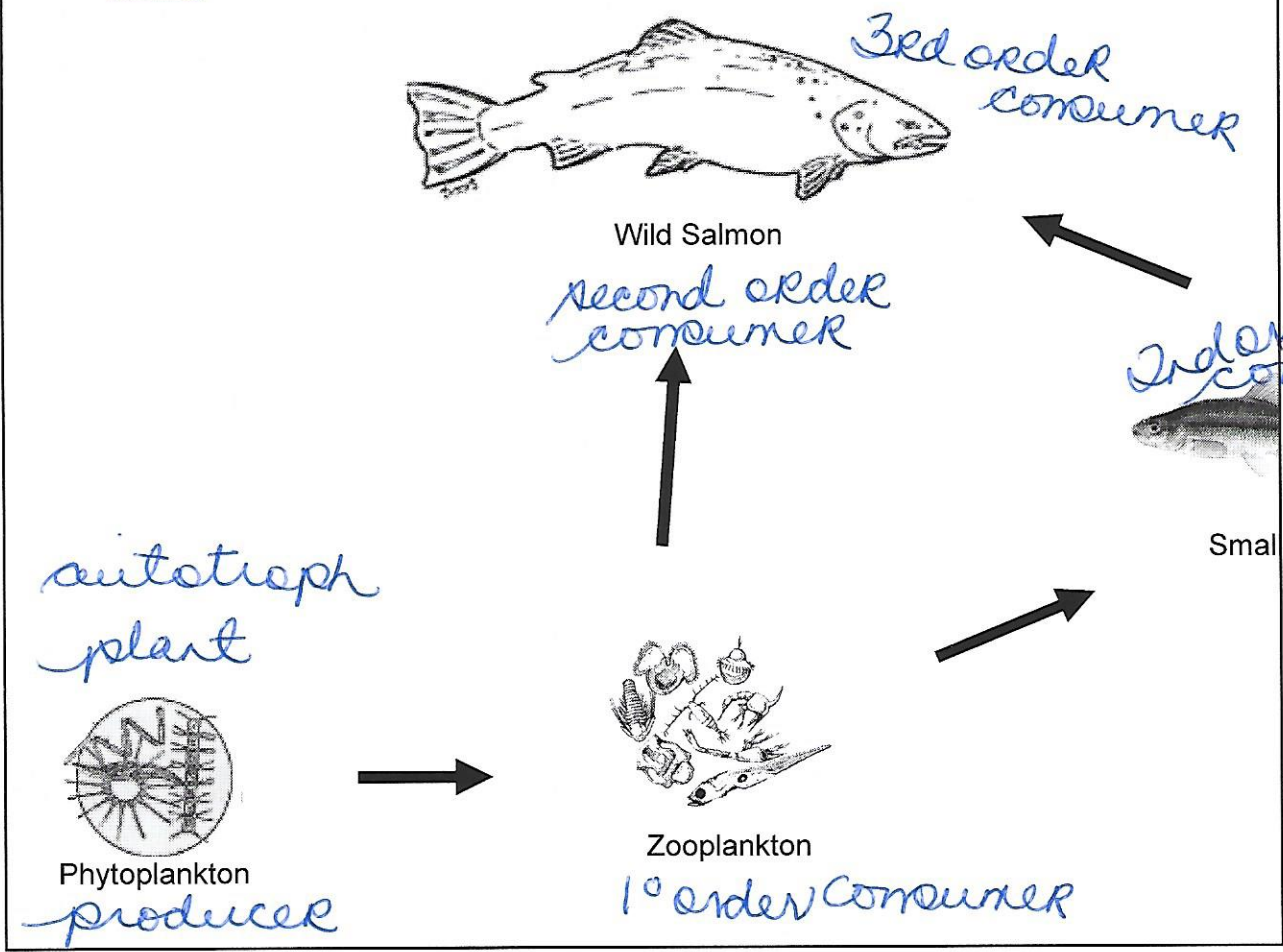
Farmed Salmon

Farmed salmon are bred and raised in pens in the ocean. They are fed fish meal (ground-up fish) and fish oil. Farmed salmon are selectively bred to be large and are generally much fatter than wild salmon.



- 1) Eat less farmed salmon
- 2) Farmed salmon are 4th order consumers!
Wild salmon are either 2° or 3° order.
Wild Salmon are fished commercially and sold to the consumer. They feed on zooplankton and small fish.
- 3) The higher up the food chain the more concentrated toxins are = the methylmercury in the water will bioconcentrate.

Food Chain for Wild Salmon
Web



4. Diabetes is a disease affecting the insulin producing glands of the pancreas. If there is not enough insulin being produced by these cells, the amount of glucose in the blood will remain high. A blood glucose level above 140 for an extended period of time is not considered normal. This disease, if not brought under control, can lead to severe complications and even death.

Answer the following questions concerning the data below and then graph it.

Time After Eating hours	Glucose mg /dL of Blood Person A	Glucose mg /dL of Blood Person B
0.5	170	180
1.0	155	195
1.5	140	230
2.0	135	245
2.5	140	235
3.0	135	225
4.0	130	200

1. What is the dependent variable and why? *blood glucose measured as a result of changing time*

2. What is the independent variable and why? *time changing time = could have changed for every 15 min etc.*

3. What title would you give the graph? *blood glucose level vs time for diabetics & non-diabetics*

4. Which, if any, of the above individuals (A or B) has diabetes? *Person B.*

5. What data do you have to support your hypothesis? *no insulin ↑ blood glucose levels after eating = to get glucose into cells & out of blood*

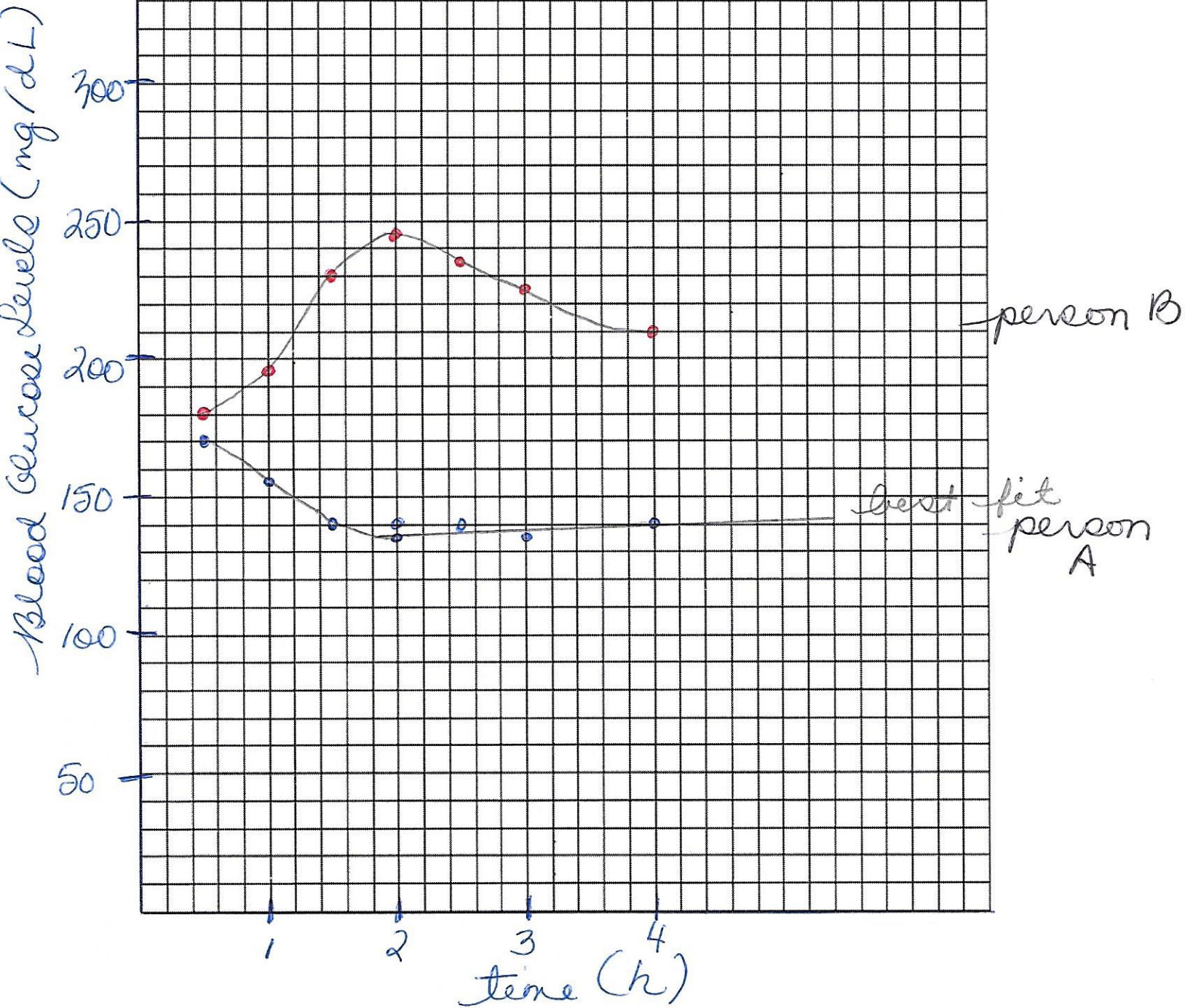
6. If the time period were extended to 6 hours, what would the expected blood glucose level for Person B?

just under 200

normal person blood levels ↓ then level off

** eat → glucose in blood
glucose in cells ← insulin*

Blood Glucose Levels After Eating as Time for 2 Individuals



* would use a French curve for data like this to get best fit