Analysing the Evidence

Use the information on pages 12–15 of the reading "Children Programmed for Obesity" to answer these questions.

The aim of the experiment was to find out whether a mother's diet during pregnancy has an effect on her offspring's risk of obesity and type 2 diabetes in adulthood. The experiments were carried out using a small animal model.

Figure 12: **Effect of Diet Before and After Birth on Obesity in Adulthood in a rat model**

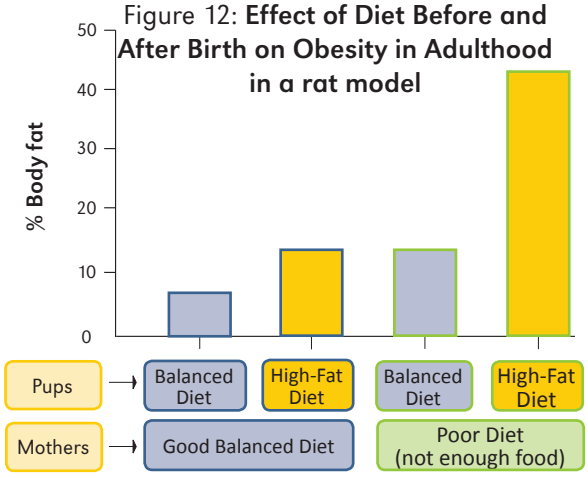


Figure 13: **Effect of Diet Before and After Birth on Risk of Type 2 Diabetes in Adulthood in a rat model**

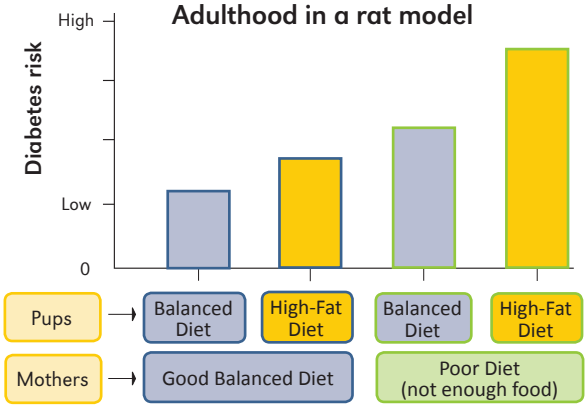


Figure 14: **Effect of Diet Before and After Birth on Voluntary Exercise (running wheel) at 145 days old in a Rat Model**

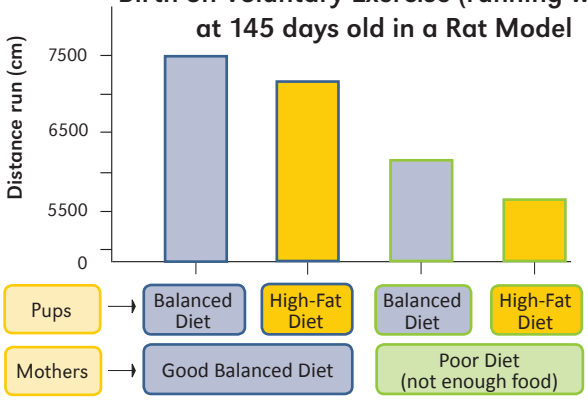
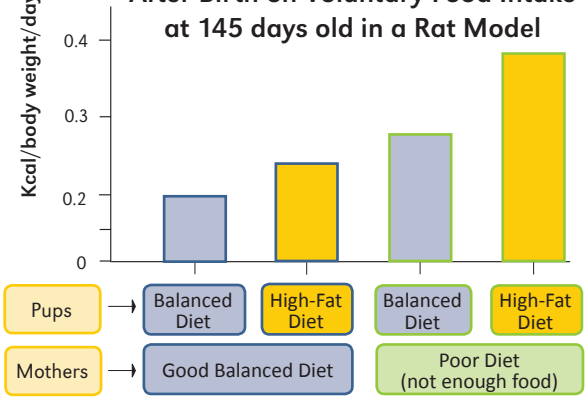


Figure 15: **Effect of Diet Before and After Birth on Voluntary Food Intake at 145 days old in a Rat Model**



What does the evidence tell us?

1. What does the information in the graphs tell us about the **effect of diet in the womb** on the **RISK of obesity** in adulthood in the rat model?
2. What does the information in the graphs tell us about the **effect of diet after weaning** on the **RISK of obesity** in adulthood in the rat model?
3. What does the information in the graphs tell us about the **effect of diet in the womb** on the **RISK of type 2 diabetes** in adulthood in the rat model? Justify your answer.
4. What does the information in the graphs tell us about the **effect of diet after weaning** on the **RISK of type 2 diabetes** in adulthood in the rat model? Justify your answer.
5. Did the scientists collect any evidence that may provide a reason why these patterns are seen?
6. Did the environment in the womb affect the phenotype of the animals when they were adults?
7. Is the evidence similar or different to that collected by Professor Barker's team in the human population? Explain how it is similar or different.
8. Write a conclusion for the experiment.

The aim of the second set of experiments was to find out whether a high fat diet during pregnancy has a similar or different effect as undernourishment on the offspring's risk of obesity and type 2 diabetes in adulthood. Remember that a high fat diet is a form of malnourishment because the person is not getting the type of nutrients that they need for health.

The experiments were carried out using a small animal model that is described on page 14 of *'Children Programmes for Obesity'*

What do these graphs tell us?

Figure 16: Effect of **maternal under-nourishment** on body fat in the offspring at adulthood in a rat model

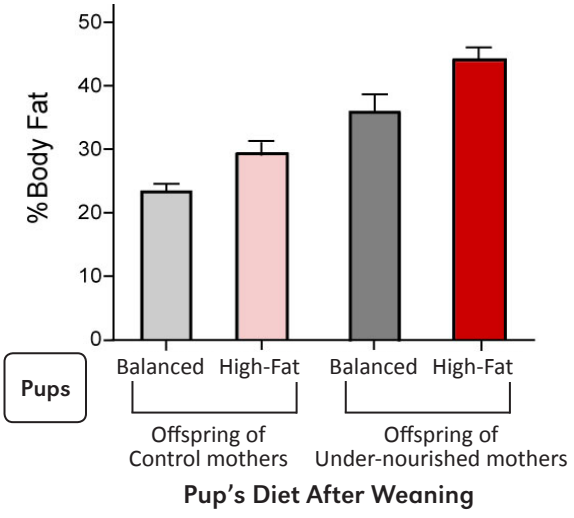
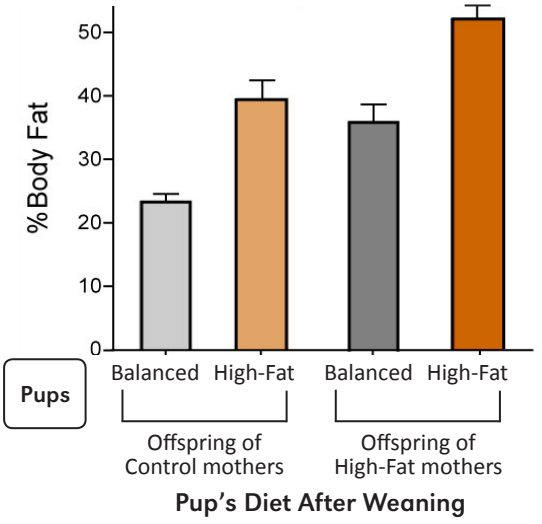


Figure 17: Effect of **maternal high-fat diet** on body fat in the offspring at adulthood in a rat model



1. What does the information in the graphs tell us about the **effect on the offspring** (pups) in adulthood when the **mother is under-nourished during pregnancy**? Are these results the same or different to the previous experiment?
2. What does the information in the graphs tell us about the effect on the offspring (pups) in adulthood when the **mother has a high-fat diet during pregnancy**?
3. Why do you think the scientists chose **balanced and high-fat** as the diets that they provide for the rat pups **after weaning**?
4. Why do you think the scientists repeated the experiments with **under-nutrition** again when they developed the high-fat model?
5. From the evidence that you have, can you predict what the effect of a high-fat diet during pregnancy might be on type 2 diabetes risk in adulthood?
6. Write a conclusion for the experiment.