Fat Intake

Health professionals believe that the average American diet contains too much fat. Although there is no recommended daily allowance for fat, it is recommended that fat intake be limited to 30% of the total calories.

You have been keeping a food intake diary for a week now. As you look back at the week, do you find that you are eating within these guidelines for fat consumption? Below, you will find information to help you calculate the percent of fat in your diet.

Conduct an investigation among your peers to determine if your intake is typical. Collect your information in an organized manner. Determine if the typical middle school student adheres to these guidelines.

Report your findings in a way that shows the scope of your investigation. How reliable is your data? Do you have "proof" of the amount of fat consumed by the typical middle school student in your community?

<u>Figuring the Percent of Fat in the Diet:</u>

Number of grams of fat x 9 calories per gram = Total number of calories from fat

Total number of calories from fat ÷ Total number of calories daily = % of calories from fat

Example:

An adolescent who eats 2,000 calories per day could figure the percent of his/her diet that was from fat if 80 grams of fat were consumed.

80 grams of fat x 9 calories per gram = 720 calories from fat

720 calories ÷ 2,000 calories = 36% from fat

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Suggested Grade Span

6-8

Task

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Alternate Versions of Task

More Accessible Version:

Health professionals believe that the average American diet contains too much fat. Although there is no Recommended Daily Allowance for fat, it is recommended that fat intake be limited to 30% of the total calories.

An adolescent who eats 2,000 calories per day could figure the percent of his or her diet that was from fat, if 67 grams of fat were consumed. 67 grams of fat x 9 calories per gram = 600 calories from fat. 600 calories/2,000 calories = 30% from fat per day.

Write a menu for 1 day that stays within this recommendation. Be sure to include all supporting data.

More Challenging Version:

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720 calories ÷ 2,000 calories = 36% from fat

Now survey students in your school to determine their favorite snack food. Analyze the nutritional value of their favorite snack. What are the nutritional benefits and potential hazards of this snack?

Context

My students had been studying nutrition in Family and Consumer Science class for a few weeks. I was teaching a statistics unit and wanted them to have an opportunity to collect, organize and analyze data. One favorite topic of early adolescents is themselves, so I thought this would be a good task.

What This Task Accomplishes

The students keep track of their total food intake for one week. At the same time they need to keep track of the calorie count and the grams of fat per serving of all the foods they eat that week. They then need to calculate the percentage of fat in their diets using the formula given on the task sheet. The second phase of the task involves each student listing his/her average percent of fat for the week on a class data chart. This gives each student the data needed to compare personal percentages against the class average. The individual student can then decide to carry the investigation further, to test other classes who are not studying nutrition, or a group of students from another school, in another community, or another state or country. Perhaps, the students would want to collect data comparing a vacation week to a school week. Is there a difference?

What the Student Will Do

Students need good directions about keeping a food diary. They need to be aware of serving sizes, the fact that they need to record everything they eat - yes, the milk on the cereal! This will take a week. They then need to use the formula and calculate the percent of fat in their diet each day and then get the weekly average. They then need to decide if they are within the guidelines and determine the average for a larger group of adolescents and decide if that group is "average" or typical in their fat consumption.

Time Required for Task

The students need at least a week to collect data in their food diaries and determine their personal percentages. I had them keep the diary before I gave them the task. The problem was that they were not keeping track of quantities and calculating percentages as they went along. I think it would work better if the resources were available as they went along and they calculated every day. What you would lose by doing it that way is the blindness of their eating patterns. If they were calculating percent of fat every day, would that affect their eating patterns?

Once the class data had been collected, it took about two class periods (50 min. each) to complete the task.

Interdisciplinary Links

This happened to tie in perfectly with our rotation through Family and Consumer Science (the old Home Economics). You could also tie this to a Health or Science class lesson on nutrition. If you have modem access, and are studying a state or country where you have an Internet connection, it would be very interesting to exchange data and compare your class averages with a group of students from another culture.

Teaching Tips

Students need a lot of guidance in keeping the food diary. Both the Family and Consumer Science teacher and I were working with them and still there were individuals with errors. A letter sent home, enlisting parental assistance, would be a good idea (and a good way to educate families as well). Many foods, which the students are eating, have the necessary information on the labels and if they think to look at the label at the time of consumption, it will save a lot of hassle later. I decided that giving them the formula as part of the task was the best idea, following the lead of New Standards tasks.

Some students still needed to be walked through it step by step. I have 48 students and wrote their names on a single sheet on the flip chart with a space for their average percentage of fat for the week. Students could then opt to use any part of the data they chose. I had recently taught them to make stem and leaf plots to organize data and box and whisker plots to represent data. You will see in the student work that some opted to represent their data using these methods.

There was a computer program available which some students took advantage of to calculate their percentage of fat. The program also suggested lower fat alternatives to the menus they entered. These programs are available through computer software catalogs, also check with your Family and Consumer Science or Health teachers.

Suggested Materials

- Calculators
- Reference books listing calorie and fat gram content of foods
- Graph paper

Possible Solutions

The solutions will vary.

More Accessible Version Solution:

Solutions will vary. When assessing the student’s solution look for correct computation, accurate reasoning and documentation to support the work.

More Challenging Version Solution:

Solutions will vary. When assessing the student's solution look for correct mathematical reasoning supported by proper documentation.

Task Specific Assessment Notes

Novice
The understanding level of this student is actually more of an Apprentice level than a Novice, but it is the lowest example I have. There is little evidence of a strategy to arrive at the calories and fat grams in the food eaten. How did the student arrive at the 32% personal intake? On page three, it looks as though s/he added only the seven numbers bracketed, but that would not give a sum of 1142. There is little or no evidence of mathematical reasoning present. There is no explanation of the solution. There is no appropriate mathematical representation. The mathematical terminology is weak.

Apprentice
There is a major gap in the solution from the calculation of 80 grams x 9 calories = 720 calories from fat, to his/her average being 31%. Where did that come from? There is evidence of mathematical reasoning present, but s/he does not carry out all mathematical procedures fully. There is appropriate mathematical representation on page three, but it is inaccurately labeled. There is some use of mathematical language.

Practitioner
This student shows broad understanding of the problem and the major concepts necessary for its solution. His/her strategy does lead to a solution, and there is effective mathematical reasoning, especially as evidenced by his/her acknowledgment of the bias of his/her sample. S/he does however fail to list quantities of foods eaten in his/her food diary. S/he communicates his/her solution clearly, using solid mathematical language and good representations. There is an error in his/her identification of the median on his/her box and whisker plot.

Expert
This student shows the deepest understanding of any of my students. S/he acknowledges that the sample of respondents is biased and offers suggestions for carrying the task beyond that bias. His/her strategy was efficient. S/he did record amounts of food at every meal and used a computer program to calculate the calories and percentage of fat. It was necessary for him/her to input the serving sizes, but this is not displayed in the print out. S/he entered the data on a daily basis. S/he did an excellent job of verifying the results by calculating the mean, mode and median of his/her data set and commenting on that comparison. His/her explanation is clear and details how the problem was solved. All of the steps are included so there is no need for the reader to infer how or why decisions were made. His/her mathematical representations are clear and accurately portray his/her results. S/he uses precise and appropriate math language throughout his/her solution.