

**Grades: 9-12**

## NOVA “The Truth About Fat”

Do we control our fat, or does it control us? For generations, overweight individuals have been stigmatized and cast as lazy. But scientists are coming to understand fat as a fascinating and dynamic organ—one whose size has more to do with biological processes than personal choices. Through real-life stories of hunter-gatherers, sumo wrestlers, and supermodels, NOVA explores the complex functions of fat and the role it plays in controlling hunger, hormones, and even reproduction.

**After watching this episode, choose from the following questions and/or tasks to extend your learning**

### Question Box 1

- Why do the scientists in this program say that fat is life?
- What did the Sumo wrestler reveal about fat?
- Who are the Hazda, and what can they tell us about man’s past?
- How do high levels of physical mobility prevent disease?
- What role does fat play in hormone production, hunger, and even pregnancy?
- What is lipodystrophy? How does it affect the body?
- How does a single spelling error lead to a defective gene?
- How did the discovery of leptos change the way scientists view obesity?
- What role does leptin play in obesity? How is weight regulated?
- What happens when you make extreme changes to your eating and physical activity?
- Explain the statement - exercise alone won't make you thin?
- Why is obesity seen as a disease? Can it be treated? What is the truth about fat?

### Question Box 2

- What is the most important thing I learned personally?
- How much did you know about the subject before we started? Explain.
- How do you feel about this program? What parts of it do you particularly like?
- How does society view weight today? What is considered beautiful? Why?

### Box 3 (Tasks)

- The average male weighs 152 pounds. Essential fat is 2-5% percent of the body
- weight. Athletes are considered to have 6-13% of body fat. Men classified as fit have 14-17% body fat. The average male has 18-25% body fat. A man classified as obese has more than 25% body fat. Create a line graph that reflects these percentages. How

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do these percentages compare with the information presented in the show? Justify your answer using mathematics.

- Compare and Contrast High Density Lipoproteins from Low Density Lipoproteins in the human body.
- Draw a chemical model of a triglyceride. Describe the parts and also describe with evidence why triglycerides, as opposed to proteins and carbohydrates, are used for energy storage.
- Describe the connection between carbohydrates and triglycerides in the human body.

#### **Box 4 (Enrichment)**

- Describe the evolutionary advantage of mammals being able to store energy as fat, and how this advantage has turned into a disadvantage for modern humans. *(ELD) Present the information orally or written.*
- Describe what is meant by, "...fat as a system akin to an organ." What evidence do scientists use to support this claim?

#### **Box 5 (Extend/Real-Life)**

- What's the connection to triglycerides and the Body Mass Index (BMI)? Calculate your own BMI [https://www.nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmicalc.htm](https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm) What does science say about the accuracy of this index?
- Not sure how to eat healthy? You are not alone. This link provides three short lessons: <https://www.healthyeating.org/Healthy-Kids/Healthy-Eating-for-Teens>
- Energize with snacks- Read through this page and note the food groups, suggested snacks and complete the "Test Your Knowledge" section. Be sure to look at the Food Group Classification link before taking the Food Classification Quiz.
- Click on the "Learn the Importance of Breakfast" link at the bottom of the page.
  - Read the page/watch the video. Write down 3 healthy suggestions for breakfast.
  - Write down two benefits of eating a healthy breakfast.
  - Do you get the recommended hours of sleep each night? Why or why not?
- Click on "Create a healthy goal and plan to achieve it." link at the bottom of the page.
  - Watch the Nutrition in a Minute- SMART Goals video.
  - What does each of the letters in SMART stand for?
  - Review the portion infographic. Are your servings within these guidelines?
- Click on "Set a SMART goal to a healthier you!" link at the bottom of the page.
  - Set your SMART goal by answering the questions.
  - *Note: Say "no" to the free fitbit to avoid entering your email address.*
  - The next screen will be your SMART goal. If you want, download the pdf to save as a reminder of your goal.