



OAR NORTHWEST: EDUCATION

CWF Africa to the Americas Expedition 2013

Lesson 4.1: Better eat your spinach!



Introduction

The four engines of the JRH (Jordan, Markus, Pat, and Adam) need fuel. How much fuel? What kind? How does the fuel needed for the crew of the JRH compare to the food you eat? In this lesson students will compare and contrast the calories they eat on a daily basis with that of the JRH crew.

Background

A Calorie (written with an upper case C) is in reality a kilocalorie, which is 1,000 calories. The daily amount of calories an individual requires is based on numerous factors. Chief among them are body build, height, gender, age, rate of metabolism, and level of activity. If an individual is in a very cold climate or extremely active, he or she will need more calories to maintain body temperature and function. Due to these variations it is necessary to use calorie estimates when making comparisons of calories consumed versus calories expended.

The diet of the JRH crew was carefully researched prior to the expedition to ensure that adequate calories are available for the arduous task of rowing across the Atlantic Ocean. Read the following blog post with careful attention to the pdf document linked at the end to get a sense of the fuel that is powering the JRH crew.

<http://oarnorthwest.com/2013/03/day-38-what-we-eat/#more-6641>

The following resources can be used to complete the activities associated with this lesson:

Nutritional Analysis Tool
<http://www.nat.uiuc.edu/>



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<http://www.myfoodrecord.com/energy/daily.html>

The above websites provide on-line programs in which you can select certain foods and then ask for an analysis of the nutrients they contain. The results also give the calorie contents for the foods chosen.

Unites States Department of Agriculture—Recommended Dietary Intakes (RDI)

<http://www.nal.usda.gov/fnic/dga/rda.pdf>

Gives the recommended daily intakes for infants, children, and males, and females above the ages of 11.

Food Labeling Education

<http://www.fda.gov/Food/ResourcesForYou/Consumers/NFLPM/ucm274593.htm>

Features information about how to read the new food label.

Activity

The following activity will provide students with an opportunity to think about their respective diets and how their diets support their activities. The crew of the JRH will serve as the comparison group and the context that will engage students in looking critically at their own diets.

By the end of this activity, students will be able to:

- Understand the nutritional value of the JRH crew's meals.
- Describe the trend in the diet changes that the JRH crew is experiencing over the course of the CWF Africa to the Americas expedition and explain the physiological consequences that these changes effect.
- Analyze caloric intake vs. caloric expenditure and recognize the pattern of slow starvation of the JRH crew.
- Analyze the nutritional balance and caloric intake of the student's own diet.

Materials

- Blue and red pen
- Copy of JRH Diet activity sheet
- Reference for calorie content of food
- Access to the Internet

Procedures

1. To help students understand what the ocean environment is like, have them read through the Expedition Blog on the OAR Northwest website (<http://oarnorthwest.com/blog/>).

Learn more: <http://oarnorthwest.com/>

Contribute: Education@oarnorthwest.com



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2. Organize students into groups and distribute the JRH Diet activity sheet. Have students review the blog post and pdf food list (<http://oarnorthwest.com/2013/03/day-38-what-we-eat/#more-6641>) of the food the crew of the JRH is consuming during the CWF Africa to the Americas Expedition.
3. Have students calculate the calories the men consumed in the meal. Have students multiply this value times three in order to estimate the caloric intake of the men in one day. Have students evaluate the sufficiency of the caloric intake of the men in terms of calories expended in a typical day by the crew. Students can make a bar graph where the vertical axis is Kcal and the horizontal axis is comparing the JRH crew to student diet. Have one column represent intake of calories and one column represent expenditure of calories. Do the men ever eat enough calories to sustain their activity levels? Have students look at the three meals and discuss the trends in the variety and the caloric sufficiency of the diet the JRH crew is consuming.
4. Have students keep a log of all the food they eat in one day. Then have them categorize it as they did the JRH crew meals. Have them add in their own number of calories consumed to the bar chart. How does their diet compare with the JRH crew's? How might the energy required for a teenager living today's life compare with the calories required of an ocean rower?
5. To conclude the lesson, have students comment on the sufficiency and/or insufficiency of their own diet. Is a one-day analysis enough data on which to base a valid conclusion? What would students need to do in order to perform a more meaningful analysis of their diet? Have students discuss how important or unimportant food is in their day. Is variety important? How would they feel if they had no bread, fruit, or vegetables for a week? Ask students to imagine what it would be like to eat the restricted diet the JRH crew is eating for months on the ocean.

Assessment Recommendations

Students may be assessed through:

- Their participation in the activity.
- The conclusions they draw about the changes they observed in the JRH crew's diet.
- The accuracy of their own nutritional assay.
- The quality of their bar graph analysis of the calories consumed vs. the calories expended.

Lesson Extensions/Adaptations

1. Research nutritional deficiency diseases such as scurvy or rickets. Is the JRH crew in danger of suffering from either of these diseases? Are there areas in the world where deficiency diseases are still prevalent today?
2. Investigate the changes a body undergoes when it is starving. For example, female runners who traditionally have little body fat may stop menstruating. How may this



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be a survival strategy for the body? Another common response to starvation is that the body's metabolism slows down significantly. How is this helpful to survival?

Citations

This lesson was adapted from the following:

<http://www.pbs.org/wgbh/nova/shackleton/classroom/w4meal.html>