1. Project Title: Nutritional Analysis Web Site

2. Project Coordinator:

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4. Introduction:

This project created a Web-based diet analysis program adequate for use as a homework assignment in Nutrition courses to promote student understanding of the relation between energy intake and expenditure. The program will be available for long-term use by students to manage their own eating behavior and body weight and as a refresher on sound principles of nutrition.

Students are required to analyze their personal diet for a 3 to 7-day time period and calculate their energy expenditure for basal metabolism, normal activity, purposeful exercise and diet-induced thermogenesis (energy cost of eating). They use the diet diary and analysis program we have developed and compare it to one or more of several similar programs available on the web to evaluate potential deficiencies and excesses in their personal diet.

The Project addressed to following **Objectives:**

(1) Convert the diet analysis to full functionality for unlimited simultaneous users by translating to the PHP programming language and a SQL database. This objective will enable students to evaluate the nutritional adequacy of their personal diet. The new program will have capacity for the current and future enrollment in the course that now use and may adopt the technology. Students will be required to critically evaluate the results generated by the computer analysis, and identify the limitations imposed by their

accuracy of data collection, the accuracy and limitations of the USDA database, and the variation in individual requirements.

(2) Automate the existing energy expenditure workbook so that students get immediate feedback if they enter incorrect calculations, and their personal data will be displayed graphically to allow them to visualize the channels for their energy expenditure. This program will enable students to become familiar with the quantitative relationships among diet, exercise and weight control. By hosting these course programs on a server outside the WebCT or Wolfware environment, students will be able to manage their own diet and exercise for personal health beyond the scope of one course. The data entered can be carried forward over a multi semester course sequence. Students engaged in community service projects through our External Learning Experience course will have access to the diet analysis program to help others in the community much like a professional dietician does.

(3) Modify the diet analysis program to provide more information on micronutrients. Computerized diet analysis will enable students to evaluate micronutrient intake from a dataset comprising their diet and those of their classmates to evaluate the risk of micronutrient excess or deficiency using some basic tools of statistical analysis and nutritional epidemiology.

METHOD
Project Design (Plan, methodology etc.)

In previous assignments using a different web site, students were asked the following questions:
Review the web site:
       A. Did you learn anything new?
       B. At what educational level do you think these pages are best directed?
       C. Would these pages motivate you or other potential clients to lose weight or improve their   nutritional habits?
       D. Did you notice any areas that should be changed or improved? How?
       E. Are there any additional features that you think we need to add?
       F. Were the analysis printouts helpful and easy to understand?
       G. Would you use a bulletin board service to get answers regarding diet and nutrition issues?
       H. Have you ever used a similar diet and nutrition program? IF yes, how does this one compare?

The students' answers to these questions helped in the design of the new web site in this project.

Timeline
This LITRE grant supported a programmer during 2006 for the following objectives: (1) convert the diet analysis to full functionality for unlimited simultaneous users by translating to the PHP programming language and a SQL database; (2) modify the diet

analysis program to provide more information on micronutrients. Additional objectives that were listed in the original proposal could not be achieved within the financial and time constraints of the grant.

The new program "NCSUNutrition" (http:www.ncsunutrition.com) improved upon the program we were previously using "NutritionWeb" (http://nutrtionweb.schaub.ncsu.edu/nutritionweb) by improving speed, ease of use, and potential automation of the workbooks for homework. The diet analysis program outsourced to a more reliable off-campus server. The rewritten program has increased security of students' personal diet data. The program will be available to students to continue their learning about foods and nutrition in subsequent courses by having access to the program to assess changes in their diet or those of others, such as when students work or volunteer in a community service environment.

The new web site was ready for beta-testing by students in NTR/FS 400 and NTR 500 in Fall 2006. It was available to 65 students in Fall 2006 and 23 students in Spring 2007. Students use the new program to reflect on their own diet and eating habits and the way that diet analysis software is used in this field to modify behavior of dieticians' clients or the public. We also asked them to compare the new program with at least one other program. We revised the homework assignment on diet and exercise and have attached a copy as Appendix 1. The students were asked to compare the programs using the table in Appendix 1 page 9-10.

Evaluation/Assessment/Data Collection & Analysis Plan
Our student learning objective for the project were as follows:

(1) Students will learn the impact of specific food choices on the nutrient quality of their diet.

(2) Students will understand and visualize the relative importance of basal metabolism, exercise, and digestion on energy expenditure and body weight. They will calculate the effect of cessation of exercise if they transition to a more sedentary lifestyle in later life on potential weight gain or impact on diet.

(3) Students will learn to evaluate diets of other students, working in a team setting, and manipulate a dataset that includes their own input, thereby understanding the different use of nutritional guidelines in assessment of an individual and assessment of a population. The team will apply statistical concepts learned in other courses to nutritional data collected in this course. This project will make assignments and interactions that have worked well in face-to-face sections applicable to students in Distance Education sections as well.

RESULTS

Effect on Student Learning

With a few exceptions, 88 students in the 2006-07 academic year had access to this program. They compared this program with at least one other program. We have not yet analyzed all the data collected, but subjective analysis of the responses we asked follows:

a) *Name of program, or web address*

Students compared our new program – NCSUNutrition, our previous program NutritionWeb, MyPyramid.gov, and occasionally a couple of other programs.

b) *Food items that required you to select different names between the programs*

In all programs, students cannot find exact entries for all the food items they ate. There fore they have to substitute a similar food that may have slightly different nutrient contents. Surprisingly, although all the programs use the USDA food database, the names of food choices are not all the same.

c) *Daily kcal intake calculated*

There were frequently differences of several under kcal per day for the same 1-day diet entered into the different programs. One program was not consistently greater than the others.

d) *Daily Fat intake calculated (g)*

Similarly, there were substantial differences in fat intake calculated from the same diet.

e) *Micronutrient differences reported by different programs (vitamin A, Zinc, caffeine?)*

The revised program reports have a much more thorough listing of micronutrients than the other programs students used. This requires the students to critically evaluate the validity of the data the program reports and possible errors in the input and output.

f) *Most interesting feature of the programs*

Generally the students liked the extensiveness of the data report. Some students thought the user interface was a significant improvement, while others did not. Complete nutrient content was provided for each food entered from their daily diet.

g) *Confusing or frustrating features of the program*

There were some confusing aspects of the user interface. The problems may have been specific to certain browsers.

h) *At what educational level is the program best directed?*

Students generally found the program to be directed at high school or college students. Some though nutrition course experience was needed for full benefit.

i) *Would the program motivate you or other potential clients to lose weight or improve their nutritional habits?*

Responses to this question seem to depend on the students experience and attitudes with weight loss programs.

j) *Did you notice any areas that should be changed or improved? How?*

The user interface was a problem for some students. The data input was on a meal basis and did not have a category for snacks. The program does not yet deal with physical activity or have some of the tool features for weight management of other programs. Inclusion of more food items in the database is a constant request.

k) *Are there any additional features that the program should include?*

More exercise and weight management features were desired.

l) *Were the analysis printouts helpful and easy to understand?*
Because of the inclusion of so many nutrients a wide spreadsheet time output results. This requires scrolling and does not always print properly.
m) Did you learn anything new from this program?
Some students reported being impressed by the complex nutrient content of foods, and looking at the relative amounts of nutrients in different food groups. Other students were more interested in the kcal and fat intake data in relation to body weight.
n)) Which program would you prefer to use to enter your 7-day diet record?
Responses to this question will be quantified after data some summer session students are available. Different program were preferred by different students.

We also looked at the ability of the program to interest students to keep using it for their own health management. Only one student who took the fall course later came back to the program in the spring semester. This student was involved in a nutrient intake project in another course (NTR 555) and presumably was using the program for that academic purpose, rather than for personal reasons.

Our use of the program has not reached the point where we can return the class data to the students for further statistical and meta-analysis, but that is still a long range goal for development of this technology.

Effect on Faculty/Pedagogy

Nutrient databases for diet analysis are an important teaching tool in nutrition courses. Some students fell that once they have done this exercise in one course there is not much gained when they do it for another course. Therefore, it seems that we must be careful to extract different learning objectives when we use similar assignments in different nutrition courses. Having specifically designed diet analysis tools such as the one built on this project will reduce the students' sense of repetition and open them to looking at their diet data in new ways.

These assignments are time consuming, both for the students to complete and for the faculty to coach the students on the tools and evaluate the results. Some students and faculty seem to believe the learning involved is worth the time and effort.

DISCUSSION
Summary of Important findings

Most students conclude that thorough analysis of their own diet and exercise through web-based programs is an important and worthwhile learning tool. They were impressed with the effort taken within our program to develop this tool. However additional features were desired that would take considerably more programming time and resources than we had available through this grant. Commercial sites and program may be better able to keep pace with developments in technology, even though they are not so specifically useful to our teaching purposes.

Conclusions

We hope to be able to further develop this program in the future to meet the needs of our students and our academic program. At the same time we will watch for the availability of reasonable priced commercial alternatives. Further development of our program requires the time of an experienced programmer. The USDA has employed a much larger team to develop MyPyramid.gov, which does some things better and other things less well than our program. That site is more likely to be kept up-to-date as Internet technology changes, but may require we modify some of our learning objectives if we try to use it more extensively in our courses.

Appendix 1. Diet Analysis assignment using the new www. NcsuNutrition.com web site:

NTR 500
Personal Diet Analysis Assignment

Objectives:

1 - To evaluate the nutritional adequacy of a record of your personal diet.
2 - To critically evaluate the results generated by computer analysis.
3 - To become familiar with the quantitative relationships among diet, exercise and weight control.
4 - To use compare computer software available to nutrition/exercise consultants.

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Part A: 7-Day Diet and Activities Diary

Collect a 7-day diet record of the foods you eat. (See instructions in Wardlaw & Hampl, 2007, Appendix G.) This length of time is often needed to get a representative sample of the variety of foods you eat. These should be consecutive days if at all possible. If not, you may spread the data collection over 2 weeks, but all food eaten in any one day of recording must be included. Be sure to include both week-days and weekend days. Write down all foods as soon as possible after eating them. Be sure to include portions, using units of measure that are easiest to estimate (e.g. slices of bread, cups of milk, grams of caviar). Use the information in your required textbook (Wardlaw & Hampl, 2007) Figure 2-7 (page 90) regarding serving sizes in the food guide pyramid. The web sites below are also helpful in determining the amount of the foods you eat.

http://www.fns.usda.gov/tn/Resources/Nibbles/servingsize_poster.pdf - This is a visual poster that helps determine Pyramid serving sizes.

http://www.usda.gov/cnpp/Pubs/Brochures/HowMuchAreYouEating.pdf - This document lists typical portions that foods come in or served as and compares them to Pyramid Serving Sizes.

http://mypyramid.gov/pyramid/index.html - This is the USDA current pyramid. You can click on the different colors and it will take you to the different food groups (or you can just click on the food group listed in the box to the right.) Within each group, you can click on that food group's Gallery (Blue button midway down the information) and you can see actual pictures of what amount of different foods in that group look like.

Note whether foods were eaten at breakfast, lunch, dinner, or morning, afternoon, or evening snack. In a restaurant or cafeteria, try to figure out what's in a casserole-type dish, so you can enter the ingredients separately. If you made a sandwich, for example, list bread and all ingredients quantitatively. There are also a number of combination foods in the database that can be substituted for others with comparable ingredients. If you have a Nutrition Facts label from foods you eat, you can update your database with this information. Some fast foods are in the database as a single entry and don't have to

be broken down into components. Be sure to include nutrient-containing condiments and beverages (e.g., salt, Tabasco Sauce, coffee with cream and sugar).

Also keep a record of your physical activities (and inactivity) over the same 7 days, including amount of time spent at each. Activities that require about the same energy expenditure, such as sitting and talking or sitting and typing, can be lumped together. You will enter these activities into the computer program yourself to compute your energy expenditure.

<p style="text-align:center">****************************</p>

Before You Go Any Further:

Read through the remainder of this assignment before you begin entering your Diet Diary into any system or working on the questions. You should also read through the PDF file located in Unit 14 titled "ntrweb_instr_tables.pdf". It contains a tutorial for the diet analysis website, "NutritionWeb", and tables needed for the following parts of this assignment. This reading will provide a full overview of the assignment before you enter data. Please note that you cannot complete the entire project at the last minute, so plan accordingly.

<p style="text-align:center">****************************</p>

Part B: Diet Analysis Programs

Several diet analysis programs on microcomputers are available to analyze your diets. Comparing some of these programs will allow you to consider their strong and weak points.

1. Review your 7-day-diet diary and select the most representative day. Enter the food from that day into at least two of the following programs, one of which should be the NutritionWeb (revised) - http://www.ncsunutrition.com. Print the results from that day.

2. Enter the complete 7-day record into either NutritionWeb, MyPyramid.gov, or NutritionWeb (revised) to compute your 7-day average.

As you work in each program, take time to examine the features provided other than diet analysis.

Program 1: NutritionWeb

NutritionWeb is a new web-based program developed at NCSU. Several shortcuts in the programming for this site require that you use Microsoft Internet Explorer 4.0 or later as your browser. Netscape, and other browsers may give you problems. Safari seems to work. The Website for this exercise is: http://nutritionweb.schaub.ncsu.edu/ncsu. You should see boxes at the bottom right of the page that say "Login" or "Register". For your first use of the site, click on the "Register" button to create a login id and password. You may select your Unity ID, but do not use your Unity password, to protect security of your other accounts. After you register, you can reenter the site from the "Login" box. If

for some reason you do not see "Login" or "Register" in the boxes at the bottom of the page, go to http://nutritionweb.schaub.ncsu.edu/nutritionweb and use this as the entry page into the site.

Write down your login ID and password for later use.

Login ID _____   Password _____

> Registering:
> You are invited to participate in a research study in which we will use the data you enter into this web site to improve the functionality of the site and demonstrate its effectiveness as a teaching tool. Your data will never be released in a format that can directly link you to your data; means of a group and points on a regression line will be the format for data publication. If you wish to participate in this study, click the top radio button before pressing the "Submit" button. If you do want to have your data used in this study, click the bottom radio button and you can complete this homework assignment and use the website for your own purposes, and your entries will be excluded from our group data analyses.

Follow the instructions that are found in the "ntrweb_instr_tables.pdf" file. They will guide through the registration process.

> **After you fill out the registration surveys (entering current body weight), complete the following worksheet (Part C) to find body weight goals that you will need in the registration process and in subsequent worksheets.**

> Helpful hints & reminders:

> 1. Since you are putting in diets for days in the past, click the word "Calendar" in the lower left of the Diet Diary Pages for access to previous days.
> 2. Do not overlap 2 months for your diet entries. The program will average all days in a month, but you may have to average 2 months manually.

Program 2: MyPyramid.gov

Go to http://www.mypyramid.gov. In a box on the left side of the page, click on "My Pyramid Tracker". Click the "New User Registration" link at the bottom. Record the login id and password below:

Login ID _____   Password _____

Enter the required personal information. Proceed to Food entry and enter the days diet. Go to "Analyze Your Food Intake" and calculate your nutrient intake.

Go to "Physical Activity Information" to calculate your energy expenditure.

Program 3: NutritionWeb (revised)

Go to http://www.ncsunutrition.com; click the register button to create a login ID and password. Then go back and log in. Enter your foods for each meal. Use the pull-down menu that appears to select the most appropriate food from the USDA database. Select the preferred units for your servings and enter the quantity eaten. Click the analyze day button to get your daily total.

Login ID _____   Password _____

Program 4: Food Processor

A site license for this program gives you access from the Schaub Hall computer lab (Room 102) or the Williams Hall computer lab. If you are familiar with this program from NTR 301, (or want to figure it out) enter your data here.

Program 5: Any other web-based or stand-alone diet analysis program you are familiar with or care to learn.

****

Part C: Under-nutrition, Over-nutrition or Acceptable Weight?

Read the section on Anthropometric measurements included in the ntrweb_instr_tables.pdf file before you begin Part C.

You will be using Appendix I (pgs A-91 to A-93) in your required textbook (Wardlaw & Hampl, 2007) to determine your frame size and ideal weight range for lowest morbidity.

height _____ in x 2.54 cm/in = _____ cm

body weight _____ lb x 0.4536 kg/lb = _____ kg

Determine your frame size:

Method 1(pg A-92): Measure your wrist circumference using a tape measure or a piece of string and a ruler at a point just distal to the styloid process, at the point where the wrist bends.

wrist circumference (cm) _____

r = height (cm)/wrist circumference (cm) = _____   frame size _____

Method 2 (pg A-93): Estimate your elbow breadth with a ruler and your fingers at the point of the two prominent bones on either side of the elbow, forearm extended upward, palm away from you (see figure below).

elbow breadth _____   frame size _____
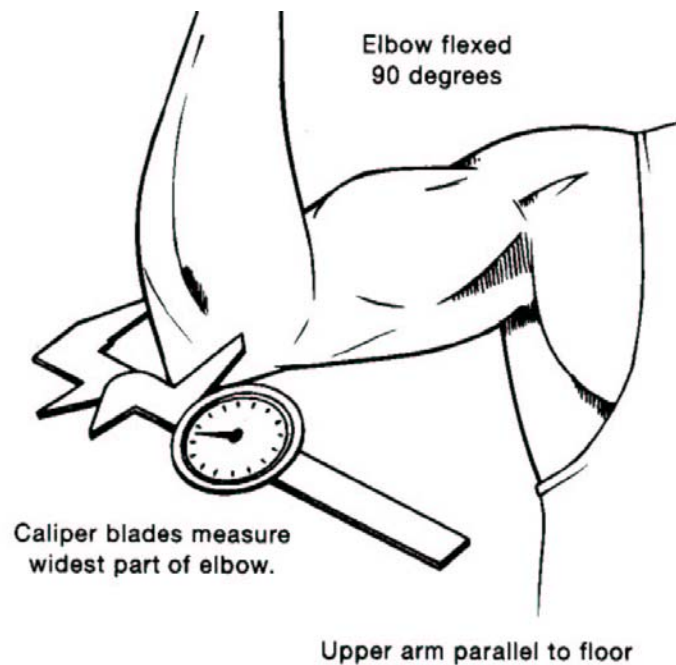
Figure 6.9 Elbow breadth is sometimes used for determining frame size. With the arm and hand in this position, a sliding caliper can be used to measure the widest point at the elbow.

TABLE 6.6 Elbow breadth classifications for males and females of various stature

Males elbow breadth							
Height[a]		Small frame		Medium frame		Large frame	
in.	cm	in.	mm	in.	mm	in.	mm
61–62	155–158	<2 1/2	<64	2 1/2–2 7/8	64–73	>2 7/8	>73
63–66	159–168	<2 5/8	<67	2 5/8–2 7/8	67–73	>2 7/8	>73
67–70	169–178	<2 3/4	<70	2 3/4–3	70–76	>3	>76
71–74	179–188	<2 3/4	<70	2 3/4–3 1/8	70–90	>3 1/8	>79
≥75	≥189	<2 7/8	<73	2 7/8–3 1/4	73–83	>3 1/4	>83
Females							
57–58	145–148	<2 1/4	<57	2 1/4–2 1/2	57–64	>2 1/2	>64
59–62	149–158	<2 1/4	<57	2 1/4–2 1/2	57–64	>2 1/2	>64
63–66	159–168	<2 3/8	<60	2 3/8–2 5/8	60–67	>2 5/8	>67
67–70	169–178	<2 3/8	<60	2 3/8–2 5/8	60–67	>2 5/8	>67
≥71	≥179	<2 1/2	<64	2 1/2–2 3/4	64–70	>2 3/4	>70

Courtesy of the Metropolitan Life Insurance Company.
[a]Table adapted to represent height without shoes.

Determine your ideal weight range:

Using the 1983 Met Life Table (pg A-91) record your ideal weight range: _____

Determine your BMI:

Use the BMI Calculator in the Tools page NutritionWeb website to determine your body Mass Index. (Quetelet's index – see next page)

BMI = Weight (kg)/ Height^2 (m^2) _____

<p style="text-align:center">or</p>

Find your BMI from the Table 13.2 p 482, Wardlaw & Hampl, 2007 _____

Is this a healthy BMI?

What BMI ranges are considered healthy?

What does your current BMI score mean?

HEIGHT

in   cm

WEIGHT

lb   kg

QUETELET INDEX

20-25 = Desirable
25-29.9 = Grade 1 obesity
30-40 = Grade 2 obesity
>40 = Grade 3 obesity
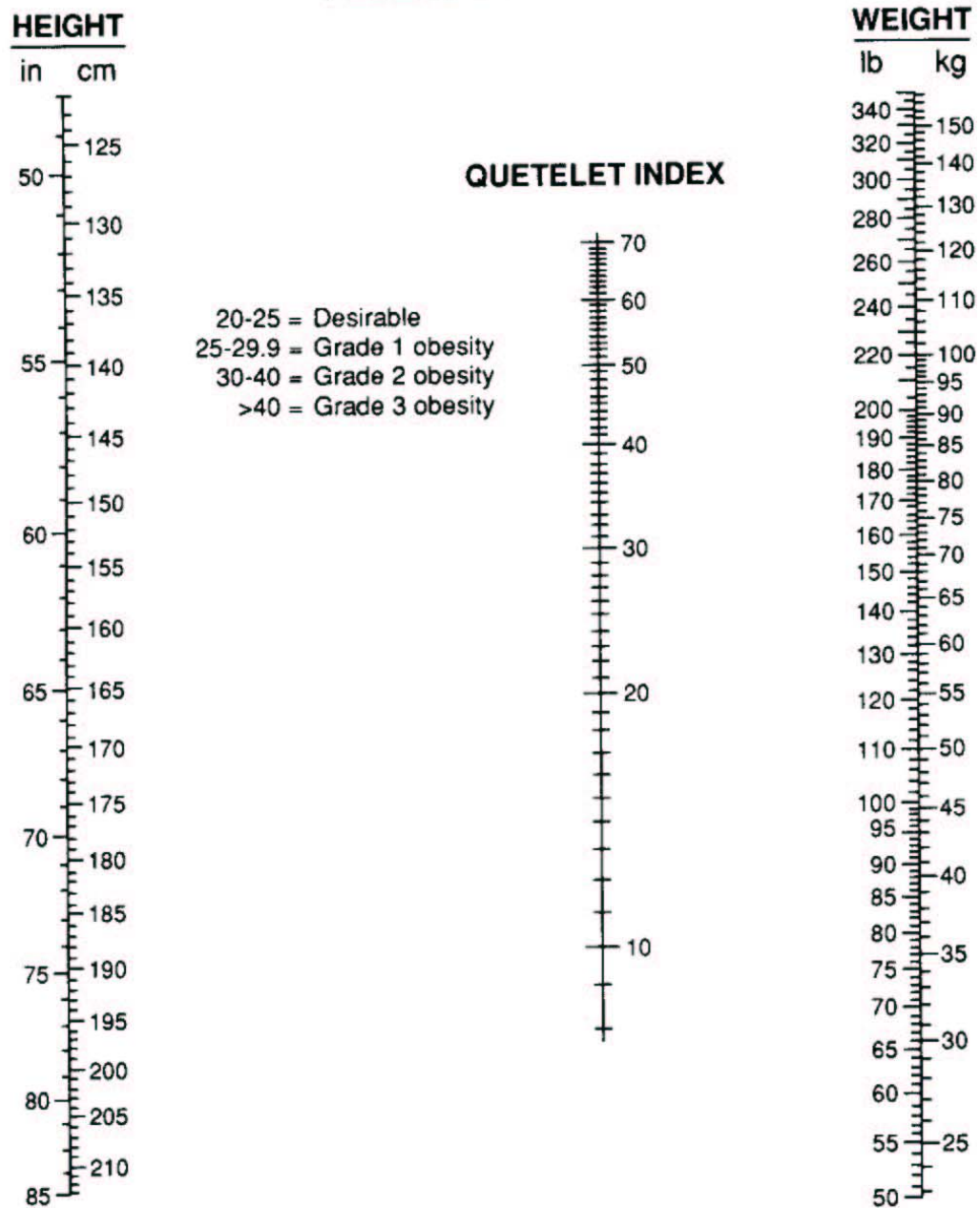
Figure 6.11 The Quetelet index (kg/m^2) is calculated from this nomogram by placing a straightedge on the measurements for height and body weight and reading the point at which the straightedge intersects the central scale.

From *Fitness and Sports Medicine—An Introduction*, by David C. Nieman. Copyright © 1990 Bull Publishing Company, Palo Alto, CA. Used with permission.

Find your weight range from the 1973 Fogarty height–weight table (Table 6.3)
_____

and

Suggested Weight for age (Table 6.4 - from Dietary Guidelines)
_____

<table>
<tr><td colspan="4">TABLE 6.3 1973 Fogarty height-weight table</td></tr>
<tr><td colspan="2">Height^a</td><td colspan="2">Weight^b</td></tr>
<tr><td>in.</td><td>cm</td><td>Males</td><td>Females</td></tr>
<tr><td>58</td><td>147</td><td></td><td>92–121</td></tr>
<tr><td>59</td><td>150</td><td></td><td>95–124</td></tr>
<tr><td>60</td><td>152</td><td></td><td>98–127</td></tr>
<tr><td>61</td><td>155</td><td>105–134</td><td>101–130</td></tr>
<tr><td>62</td><td>157</td><td>108–137</td><td>104–134</td></tr>
<tr><td>63</td><td>160</td><td>111–141</td><td>107–138</td></tr>
<tr><td>64</td><td>163</td><td>114–145</td><td>110–142</td></tr>
<tr><td>65</td><td>165</td><td>117–149</td><td>114–146</td></tr>
<tr><td>66</td><td>168</td><td>121–154</td><td>118–150</td></tr>
<tr><td>67</td><td>170</td><td>125–159</td><td>122–154</td></tr>
<tr><td>68</td><td>173</td><td>129–163</td><td>126–159</td></tr>
<tr><td>69</td><td>175</td><td>133–167</td><td>130–164</td></tr>
<tr><td>70</td><td>178</td><td>137–172</td><td>134–169</td></tr>
<tr><td>71</td><td>180</td><td>141–177</td><td></td></tr>
<tr><td>72</td><td>183</td><td>145–182</td><td></td></tr>
<tr><td>73</td><td>185</td><td>149–187</td><td></td></tr>
<tr><td>74</td><td>188</td><td>153–192</td><td></td></tr>
<tr><td>75</td><td>191</td><td>157–197</td><td></td></tr>
</table>

Courtesy of the Metropolitan Life Insurance Company.
^aHeight without shoes.
^bWeight without clothing.

<table>
<tr><td colspan="3">TABLE 6.4 Suggested weights for adults</td></tr>
<tr><td></td><td colspan="2">Weight (lb)^b</td></tr>
<tr><td>Height^a
(in.)</td><td>19 to 34 years</td><td>35 years and older</td></tr>
<tr><td>60</td><td>97–128^c</td><td>108–138</td></tr>
<tr><td>61</td><td>101–132</td><td>111–143</td></tr>
<tr><td>62</td><td>104–137</td><td>115–148</td></tr>
<tr><td>63</td><td>107–141</td><td>119–152</td></tr>
<tr><td>64</td><td>111–146</td><td>122–157</td></tr>
<tr><td>65</td><td>114–150</td><td>126–162</td></tr>
<tr><td>66</td><td>118–155</td><td>130–167</td></tr>
<tr><td>67</td><td>121–160</td><td>134–172</td></tr>
<tr><td>68</td><td>125–164</td><td>138–178</td></tr>
<tr><td>69</td><td>129–169</td><td>142–183</td></tr>
<tr><td>70</td><td>132–174</td><td>146–188</td></tr>
<tr><td>71</td><td>136–179</td><td>151–194</td></tr>
<tr><td>72</td><td>140–184</td><td>155–199</td></tr>
<tr><td>73</td><td>144–189</td><td>159–205</td></tr>
<tr><td>74</td><td>148–195</td><td>164–210</td></tr>
<tr><td>75</td><td>152–200</td><td>168–216</td></tr>
<tr><td>76</td><td>156–205</td><td>173–222</td></tr>
<tr><td>77</td><td>160–211</td><td>177–228</td></tr>
<tr><td>78</td><td>164–216</td><td>182–234</td></tr>
</table>

Source: Nutrition and Your Health: Dietary Guidelines for Americans, 3d ed., U.S.
Department of Agriculture and U.S. Department of Health and Human Services, 1990.
^aWithout shoes.
^bWithout clothes.
^cThe higher weights in the ranges generally apply to men, who tend to have more
muscle and bone; the lower weights more often apply to women, who have less
muscle and bone.

From the calculations made in Part C and your judgment, decide if weight loss or gain is advisable. If so, choose a desired new BMI and work back through the calculations to find a desired new body weight. **Use this value as your goal weight on your NutritionWeb diet and activity plan.**

Advisable for you: weight loss _____ or gain _____ or neither _____

{1}   Goal Weight _____

Go to the NutritionWeb Diet Diary page. Use this weight to update your desire weight goal. Press Update Goals in the "Goals " box on the left side of the page.
Comments:

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Part D: Enter and Analyze Your Diet

Enter your 1-day diet into at least 2 programs described in Part B.

Use the output from these programs to answer the questions in the following table. Remember that one program should be NutritionWeb (revised) - www.ncsunutrition.com

(You may reformat the table if you have a better arrangement.)

	Program 1	**Program 2**	**Program 3 (optional)**
a) Name of program, or web address			
b) Food items that required you to select different names between the programs			
c) Daily kcal intake calculated			
d) Daily Fat intake calculated (g)			
e) Micronutrient differences reported by different programs (vitamin A, Zinc, caffeine?)			
f) Most interesting feature of the programs			
g) Confusing or frustrating features of the program			
h) At what educational level is the program best directed?			
i) Would the program motivate you or other potential clients to lose weight or improve their nutritional habits?			
j) Did you notice any areas that should be changed or improved? How?			
k) Are there any additional features that the program should include?			

l) Were the analysis printouts helpful and easy to understand?			
m) Did you learn anything new from this program?			
n) Which program would you prefer to use to enter your 7-day diet record?			

Part E: Diet Analysis Interpretation

Now complete your 7-day diet and exercise record analysis on NutritionWeb, MyPyarmid.gov, or NutritonWeb (revised).

For NutritionWeb: The instructions found in the "ntrweb_instr_tables.pdf " file will guide you through this process. Because we can view your entries into the NutritionWeb program with the Login ID and Password you supplied above, it is not necessary to print out the list of foods or the various charts and table for evaluating your Nutrient Intake, Calorie Source, Fat Source, etc.

For MyPyramid.gov: Please make sure to turn in the portions of the report that could not be accessed with the Login ID and Password you provided which were most informative and allowed you to answer the questions below.

For NutritionWeb (revised): Again, because we can view your entries into the NutritionWeb (revised) program with the Login ID and Password you supplied above, it is not necessary to print out the list of foods or the various charts and table for evaluating your Nutrient Intake, Calorie Source, Fat Source, etc.

****

1.   How close was your diet composition to the Dietary Goals for protein, carbohydrate and fat?

        A. Which foods made the greatest contribution toward each of these energy sources?

        B. How did your diet compare to the Dietary Goals for fat composition?

        C. Which foods gave the greatest amount of saturated and polyunsaturated fats?

2.   In comparison with your DRI for various nutrients, (Inside front cover of Wardlaw & Hampl (2007) - textbook), does your diet analysis for the week indicate any dietary excess?

        A. What criteria would you consider excess?

        B. What foods in your diet contributed most to the excess?

        C. Should you change your diet to correct this excess? (Explain).

3.   In what nutrients was your diet potentially deficient?

        A. What criteria do you consider deficient?

        B. What foods could be added to correct such a deficiency?

        C. If the program indicated any deficiencies, do you think these are of real concern, or do they   appear for some other reason (such as limited database entries)?

4.   Briefly discuss the sources of error in this analysis that might affect the way that a nutritionist uses this program for a client.

Did you follow procedures to obtain the most accurate data and analysis?

Comment on factors that were outside of your control.

                        ****

Part F: Diet, Exercise, and Weight Control

This part of the assignment is to be done after you complete the diet analysis using the NutritionWeb, MyPyramid.gov or NutritionWeb (revised) program.

Calculate your Normal Energy Expenditure:

Select the appropriate Harris-Benedict equation from Wardlaw & Hampl (2007), page 473, to calculate your resting energy expenditure (REE).

　　　　Body weight in Kg _____ (Refer back to Part C where you converted your weight in lbs to Kg)

　　　　Equation from Table 3-1: _____

{2}　　　your REE = _____kcal/day

Complete the following table to calculate a weighted REE factor for an average day, or if you engage in strenuous exercise, for days with and without such exercise. Examples of this calculation are included in the section on Estimating Energy Requirements for the RDA "3, Energy", 10th Edition found at the end of the "ntrweb_instr_tables.pdf " file. With the information in Table 3-2, follow the example in Table 3-3 to determine multiples of your REE due to the Physical Activity Level (PAL) of your daily activities. Choose activity values carefully, following the RDA examples.

Activity Multiples of REE	Avg. or Light Day Duration (hr)	Product	Exercise or Active Day Duration (hr)	Product
Resting 1.0	_____	_____	_____	_____
Very light 1.5	_____	_____	_____	_____
Light 2.5	_____	_____	_____	_____
Moderate 5.0	_____	_____	_____	_____
Heavy 7.0	_____	_____	_____	_____
Total	_____	_____	_____	_____
Hourly Mean REE (total product/24)	_____		_____	

　　　　Weighted mean multiplier factor (number between 1 and 7)
{3}　　　(Calculated from equation below)　　　　　　_____

$$\frac{\text{(Number of light days/wk } \mathbf{X} \text{ light day mean)} + \text{(number of active days/wk } \mathbf{X} \text{ heavy day mean)}}{7}$$

Multiply your REE {2} by the weighted REE factor {3} to determine energy expenditure:

{4}   Weighted Average daily Energy Expenditure   _____

Compare this weighted average with the average energy requirement for your category in RDA Table 3-5 below.   _____

TABLE 3-5   Median Heights and Weights and Recommended Energy Intake

Category	Age (years) or Condition	Weight (kg)	Weight (lb)	Height (cm)	Height (in)	REE[a] (kcal/day)	Multiples of REE	Average Energy Allowance (kcal)[b] Per kg	Average Energy Allowance (kcal)[b] Per day[c]
Infants	0.0–0.5	6	13	60	24	320		108	650
	0.5–1.0	9	20	71	28	500		98	850
Children	1–3	13	29	90	35	740		102	1,300
	4–6	20	44	112	44	950		90	1,800
	7–10	28	62	132	52	1,130		70	2,000
Males	11–14	45	99	157	62	1,440	1.70	55	2,500
	15–18	66	145	176	69	1,760	1.67	45	3,000
	19–24	72	160	177	70	1,780	1.67	40	2,900
	25–50	79	174	176	70	1,800	1.60	37	2,900
	51+	77	170	173	68	1,530	1.50	30	2,300
Females	11–14	46	101	157	62	1,310	1.67	47	2,200
	15–18	55	120	163	64	1,370	1.60	40	2,200
	19–24	58	128	164	65	1,350	1.60	38	2,200
	25–50	63	138	163	64	1,380	1.55	36	2,200
	51+	65	143	160	63	1,280	1.50	30	1,900
Pregnant	1st trimester								+0
	2nd trimester								+300
	3rd trimester								+300
Lactating	1st 6 months								+500
	2nd 6 months								+500

[a] Calculation based on FAO equations (Table 3-1), then rounded.
[b] In the range of light to moderate activity, the coefficient of variation is ±20%.
[c] Figure is rounded.

Energy intake from 7-day diet record is listed as "Actual" Calories (per day) of the "Calories per Day Table" of the Weekly Analysis, Diet Summary.

{5}   kcal/day _____

Difference between Average Energy Expenditure {4} and Average Intake {5}:

     kcal/day _____

Assuming the numbers are consistent and representative averages, and 1 pound of fat contains 3500 kcal, how many days will it take to gain or lose 1 lb?
_____

Is this change consistent with your experience? Explain any discrepancies:

****

Part G: Diet Induced Thermogenesis (DIT)

(Also called Specific Dynamic Effect, Specific Dynamic Action, Heat Increment, Thermic Effect of Food) DIT is the energy contained in a food that is lost as heat when those nutrients are converted to fat.

DIT for fat is approximately 3%
DIT for carbohydrate is approximately 23%
DIT for protein is approximately 24%

Calculate this effect on the energy in your diet by using the percentage of your diet kcal that came from fat, carbohydrate and protein (whole numbers 0 to 100)

en% kcal from fat _____ x .03 = _____

en% kcal from carbohydrate _____ x .23 = _____

en% kcal from protein _____ x .24 = _____

Total 1 _____   Total 2 _____

Total Energy   **X**   % from (fat + protein + CHO)   **X**   % for DIT   **=**   Diet Induced
Intake (kcal/day)   (Total 1)   (Total 2)
Thermogenesis

_____   **X**   _____/100   **X**   _____/100 **=**
_____kcal/day

Now assume you switch to a very low fat diet, say 15% of calories, with comparable increase in the percentage from carbohydrate (or if your diet already is less than 25% fat, assume a high fat diet of 50 en%.) Calculate the new diet induced thermogenesis:

en% Cal from fat _____ x .03 = _____%

en% kcal from carbohydrate _____ x .23 = _____%

en% kcal from protein _____ x .24 = _____%

Total 1 _____   Total 2 _____

Diet						Diet Induced
kcal/day	**X**	Total 1	**X**	Total2	=	Thermogenesis
_____	**X**	_____/100	**X**	_____/100	=	_____kcal/day

What is the difference between this value and the DIT of your normal diet?
_____kcal/day

With no other change in your kcal intake, how long would it take for this change alone to cause an additional loss (or gain) of l lb of fat (3500 kcal)?   _____days

What likely change in kcalorie consumption would come from such a change in dietary pattern?

Why?

Name an item and quantity of food from your diet record that contains about the same number of kcalories as the DIT difference you calculated. Use your food list for suggestions.

<div align="center">*******************************</div>

Part H: Weight Change by Exercise

This section allows you to calculate the amount of exercise needed to achieve a desired weight change. Use the exercise segment of the diet diary of NutritionWeb, or use the "Analyze Physical Activities" module of the MyPyramid Tracker.

1. Enter your target weight used in the NutritionWeb Goals box (Line {1}, above). If your current weight is acceptable, assume that you had gained 10-15 pounds and need to get back to present weight.

_____

Enter the number of days in which to lose the desired weight: _____

Rate of loss (lb/day) _____
More than 2 pounds per week is not recommended. Why not?

Energy balance needed (lb/day) x 3500 kcal/lb: _____(kcal/day)

2. Use the Tools feature in NutritionWeb as detailed in the "Instructions for Using the NutritionWeb Web Site" in the on-line tutorial.

    a. Click on the "Energy Calculator" to find your normal energy expenditure for your gender, weight, and usual activities. (Purposeful exercise is added later).

                  _____kcal

    b. Click on the "Exercise Calculator". Add the purposeful Exercise activities above your normal activity level you recorded along with you diet record in this assignment. If you have already entered these exercises along with your diet record, you may use the value in the "Actual" row under "Exercise Calories Burned" in the "Calories Per Day Table" of your weekly summary.

           Exercise kcal: _____

    c. Sum (a) and (b) above to find your daily energy expenditure: _____kcal

    How close did the estimates from the RDA Methodology (Part F, line {4} above) come to your recorded/computed energy expenditure per day?

3. How well does your "Caloric intake" ("Actual" row of Calories per Day Table, weekly Summary, line {5}) match your energy expenditure?

    Explain any discrepancies.

4. Calculate weight gain from cessation of activity.

    Many athletically active high school or college students find that competitive team sports end with graduation. A high dietary kcalorie intake may have become a habit needed to meet the energy expenditure of sports. If the sports program and energy expenditure stops and energy intake is not adjusted accordingly, obesity can result within a few years.

Use the Exercise Calculator on the Tools Page of NutritionWeb to calculate the energy cost of your present activity level and convert to an equivalent amount of fat burned per day. How much fat would be lost?

<p style="text-align:center">************************************</p>

Make sure that you complete and turn in the following items:

1. Part C Worksheet – Under-Nutrition, Over-Nutrition, or Acceptable Weight
2. Part D Table and the pertinent program outputs that allowed you to complete it.
3. Any diet analysis reports that can not be accessed via the Login ID and Password that you provide in the assignment.
4. A comparison of your nutrient report with your RDA for the nutrients analyzed by NutritionWeb, MyPyramid.gov or NutritionWeb (revised).
5. Part E concerning potential nutrient excesses and deficiencies.
6. The answers to questions and worksheets found in Parts F – H.