Grown Local
Sold the Kentucky Proud Way

Janet Drake, 8th grade, Woodford Middle School
Acknowledgements

The Kentucky Farm 2 School curriculum (KF2S) was developed through collaboration between the University of Kentucky Cooperative Extension Service and the Kentucky Department of Agriculture.

Authors:
• Diana Drury, M.S.
  Extension Associate
  University of Kentucky, College of Agriculture
• Tina Garland
  Farm to School Program Coordinator
  Kentucky Department of Agriculture
• Jackie Walters, MBA, RD
  Extension Specialist
  University of Kentucky, College of Agriculture

Editor:
Terri McLean

Design and Layout:
Rusty Manseau

For more information about the Kentucky Farm 2 School curriculum, please contact:

Diana Drury or Jackie Walters
University of Kentucky Nutrition Education Program
1 Quality Street, Suite 692
Lexington, Kentucky 40507
(859) 257-2948
Diana.drury@uky.edu
Jwalt3@email.uky.edu

Or

Tina Garland
Kentucky Department of Agriculture
Division of Food Distribution
107 Corporate Drive
Frankfort, Kentucky 40601
(502) 573-0282
Tina.garland@ky.gov
Curriculum Table of Contents

- KF2S Curriculum Description and Overview
- Pre and Post Evaluation
- Featured Program Questions
- Impact Statement
- Lesson 1: Know Your Local Farmers and What They Do For You
- Lesson 2: The Grains of Your Community
- Lesson 3: Farm Fresh Veggies
- Lesson 4: Fruits From the Farm
- Lesson 5: Only a Little Oil Will Do!
- Lesson 6: Not Just Milk Alone
- Lesson 7: Powerful Protein
- Lesson 8: Wrapping It Up
- References
What is it?
The Kentucky Farm 2 School (KF2S) Curriculum is a series of eight units to teach students to:
- Recognize the sources of their foods.
- Explain the relationship of local production to improved food quality and nutrition.
- Understand the importance of thriving agricultural businesses to healthy communities.
- Identify the skills and knowledge individuals need to succeed in the farming industry.
- Increase consumption of locally produced food and agricultural products.
- Increase consumption of fruits and vegetables.

This research-based curriculum provides:
- Curriculum overview
- Kentucky core academic standards
- Curriculum matrix
- Planning guide
- Tips for delivery
- Evaluation tools
- Additional resources
- References

The curriculum contains an introductory unit, one unit for each food/commodity group, a unit on oils and sugars, and a summary unit. Each interactive unit contains:
- Facilitator’s guide/lesson plan, providing a unit summary, objectives, preparation suggestions, material lists, additional resources, main points, and suggested activities for reinforcement and evaluation.
- Handouts and/or activity sheets.
- PowerPoint® presentations.

Why offer a Kentucky Farm 2 School curriculum?
In 2010, Kentucky had the fifth highest rates for obesity in the United States, and is also among the states with the lowest per capita consumption of fruits and vegetables, according to the United States Department of Agriculture (USDA) Food Environment Atlas web site. The USDA Food Environment Atlas shows that Kentucky farmers, struggling with loss of tobacco sales, have recognized a low income from direct sales of their products, compared to those in other states. Kentucky is among the states with the lowest number of vegetable acres harvested per capita in 2007. Furthermore, Kentucky had no farm to school programs recognized by the United States Department of Agriculture Food Environment Atlas in 2009. The positive relationships among better health, increased consumption of fruits and vegetables, higher direct farm sales per capita, and higher numbers of farm to school programs support the need to promote local food systems, including farm to school programs. The experiences of the current Kentucky Department of Agriculture Farm to School Coordinator demonstrate that today’s young Kentuckians have little understanding of how their food is grown, the role the farmer plays in supporting their health and the economic wellbeing of the community, or even the myriad skills required to succeed in farming.
There is evidence to suggest that educating young people about the value of supporting local food systems will result in increased consumption of local produce. The constructivist learning perspective asserts that learners are active constructors of their own knowledge. Following this learning theory, teachers provide situations and questions that lead students to contemplate their own ideas, build upon their own experiences, and further reorganize their own experiences. The Kentucky Farm 2 School curriculum was developed according to the constructivist learning perspective. Implications for teaching Kentucky Farm 2 School are (1) to focus on the system of interrelationships among the concepts, (2) to require students to explain the connections among them, and (3) to implement them logically in different problems and other situations (Gredler, 2005.) According to Piaget, to understand is to discover, or reconstruct by rediscovery, and such conditions must be complied with, if in the future, individuals are to be formed who are capable of production and creativity and not simply repetition (Piaget, 1973.)

Who is the target audience?
The target audience for the KF2S Curriculum is high school students. Many high school students hold paying jobs or receive an allowance from their parents that supplies expendable income. They engage in extra-curricular activities and work that require them to be away from home during regular family meal times. They are beginning to make their own decisions about food and other purchases. In short, they are forming habits and beliefs that will affect their behavior as consumers throughout their lives. This is an opportune time to introduce questions about the value of a local food system.

How can the Kentucky Farm 2 School curriculum be implemented?
The curriculum is designed to be implemented within the high school classroom. Curriculum activities are interdisciplinary, and are adaptable for various grade levels. The curriculum has been aligned with the Department of Education’s Kentucky Core Academic Standards (KCAS). The curriculum is also aligned with the Kentucky Occupational Skills Standard Assessment (KOSSA) for elements included in the Agriculture and Family and Consumer Sciences areas. Depending upon the conformation of the individual school system, the curriculum may fit best into the syllabus of the Agriculture, Family and Consumer Sciences, Health, or another program. Alternatively, the curriculum can be divided among disciplines so that different units are taught as part of various subjects.

The curriculum can be implemented by classroom teachers, county Extension agents, Extension assistants or volunteers under the supervision of Extension agents, or agents of the Kentucky Department of Agriculture. While the curriculum is designed to be used within the context of the classroom, it may also be delivered within other venues such as 4-H camps, summer camps, Girl Scout or Boy Scout meetings, special interest clubs, and other programs.

Each unit of the Kentucky Farm 2 School Curriculum provides core activities and additional suggested activities. However, in order to evaluate the effectiveness of the curriculum, it is essential that students complete Activity Sheet 1-2, Focus on Food and Farming, during Unit 1 and Unit 8 of the curriculum. Comparison of students’ responses pre- and post-implementation provide curriculum
evaluation by determining whether participants have increased their consumption of fruits and vegetables, whether they have increased their consumption of local products, and whether they are more likely to know the sources of their foods.

Instructors should plan to implement the curriculum over ten or more sessions. Each unit contains activities that will require students to invest a substantial amount of time in exploration and discovery. Students will need time to share and discuss their experiences if they are (1) to focus on the system of interrelationships among the concepts, (2) to be able to explain the connections among them, and (3) to implement them logically in different problems and other situations. Therefore, instructors will want to plan time for presentation and/or discussion after completion of projects. Unit 1 provides a basis for evaluation for the entire curriculum. Additionally, it prepares the foundation for all curriculum objectives. For this reason, those teaching the curriculum may find it prudent to spend additional time on Unit 1.

Interviews, Guest Speakers and Field Trips

In order to recognize the sources of their foods, understand the importance of thriving agricultural businesses to healthy communities, and identify the skills and knowledge necessary to succeed in the farming industry, it is important for students to establish relationships with local producers, processors, and distributors. To this end, there are some activities which are appropriate for every lesson unit in the curriculum. If possible, teachers are strongly encouraged to

• Arrange for local producers and processors to visit the classroom.
• Arrange class field trips to farms, processing plants and distribution companies.
• Assign students to interview a local producer, processor or distributor. Interviews may be recorded or filmed to share with classmates. If the school has a morning news program, parts of the interview may be broadcast. If the school student body produces a newspaper, an article could be contributed, reporting on the interview.

In each assignment, students should be encouraged to discover the following:

• How does the producer plan his or her crops? What factors influence his or her decisions?
• What factors influence the success of his or her harvest?
• How does the producer harvest his or her crop?
• How does the producer market his or her crop?
• How does the producer deliver his or her crop to the processor or consumer? How costly is delivery? Does the producer have capacity to store product before delivery?
• How does the processor obtain the crop? Who bears the cost of transportation?
• Where does the raw material come from?
• How does the processing procedure work? How long does it take?
• How does the processor deliver the product to the consumer? Who bears the cost of transportation?
• How does the distributor receive the product from the producer or processor? Who bears the cost of transportation?
• Where does the product come from?
How does the distribution system work?
• How long does the distributor store products?
  What does that cost?
• How much area does the distributor cover with delivery?

Identify the skills and knowledge individuals need to succeed in the farming industry.
• Increase consumption of locally produced food and agricultural products.
• Reach Kentucky Core Academic Standards for each grade level.

References


Mission Statement
The Kentucky Farm 2 School (KF2S) curriculum provides research-based information to Kentucky high school students to help them:
• Recognize the sources of their foods.
• Explain the relationship of locally produced food to improved quality and nutrition.
• Understand the importance of thriving agricultural businesses to healthy communities.
PRE & POST EVALUATION

Ben Broods, 6th grade, Woodford County Middle School

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Pre & Post Test Evaluation/Assessment

Pre-curriculum evaluation results from Focus on Food & Farming, activity 1-2 and 8-1

<table>
<thead>
<tr>
<th></th>
<th>Grains</th>
<th>Fruits</th>
<th>Vegetables</th>
<th>Dairy</th>
<th>Proteins</th>
<th>Oils</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL NUMBER OF SERVINGS</strong> (Consumed by class taught)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF KENTUCKY PROUD SERVINGS</strong> (Consumed by class taught)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF FOODS SOURCED</strong> (Consumed by class taught)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Post-curriculum evaluation results from Focus on Food & Farming, activity 8-1

<table>
<thead>
<tr>
<th></th>
<th>GRAINS</th>
<th>FRUITS</th>
<th>VEGETABLES</th>
<th>DAIRY</th>
<th>PROTEINS</th>
<th>OILS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL NUMBER OF</strong>&lt;br&gt;<strong>SERVINGS</strong>&lt;br&gt;(Consumed by class taught)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF</strong>&lt;br&gt;<strong>KENTUCKY PROUD SERVINGS</strong>&lt;br&gt;(Consumed by class taught)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL NUMBER OF</strong>&lt;br&gt;<strong>FOODS SOURCED</strong>&lt;br&gt;(Consumed by class taught)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Comparing the pre and post test:

What is the percent change of fruits and vegetables consumed?  

What is the percent change in Kentucky Proud products consumed?  

What is the percent change of students sourcing their food?  

Featured Program Questions

What is the percentage of students consuming more fruits and vegetables? __________
What is the increased percentage of students consuming Kentucky Proud products? __________
What is the increased percentage of students sourcing their food? __________
Impact Statement Report

Reporting period: ____________ - ____________  Name: ________________________________

Title: Kentucky Farm to School (KF2S) Curriculum

CMAP:

PAC: 260 Accessing Nutritious Food

Statement: Kentucky currently ranks among the most obese states in the United States, and is also among the states with the lowest per capita consumption of fruits and vegetables. Meanwhile, Kentucky farmers recognize a relatively low return on direct farm sales to local consumers, compared with those of other states. From the United States Department of Agriculture Food Environment Atlas web site (http://maps.ers.usda.gov/FoodAtlas/foodenv5.aspx) ______________ County has an adult obesity rate of ______________ (range.) The ratio per capita of fruits and vegetables versus prepared food consumed in ______________ County is ______________, compared to that of states such as Wisconsin, Illinois, and New York, where the ratio is 61 to 83 (2011). Farmers in ______________ County recognize a return of ______________ dollars from direct farm sales per capita, compared to a return of $51 to $275 per capita in some parts of other states, including California, Washington, Wisconsin, New York and Virginia. In order to help high school students in ______________ County:

• Recognize the sources of their foods
• Explain the relationship of locally produced food to improved quality and nutrition
• Understand the importance of thriving agricultural businesses to healthy communities
• Identify the skills and knowledge necessary to succeed in the farming industry
• Increase their consumption of locally produced food and agricultural products, and
• Eat more fruits and vegetables,

______ agents taught the Kentucky Farm to School (KF2S) Curriculum to ______ students. Data from the KF2S evaluation system shows that ______% of the students improved knowledge of food systems by developing an awareness of the source of their food. Of the students who participated, ______% completed one or more assignments in which they analyzed, evaluated and presented information related to a food/commodity group. The number of students reporting eating more fruits and vegetables was ______________, or ______ percent. High school students increased their awareness of the source of their food by ______% and ______% reported increasing their consumption of Kentucky Proud products.

Date created: ___________________________
Lesson 1

Introduction

Let’s Grow the Healthy

Kentucky Proud

Elizabeth Cameron, 6th grade, Rockcastle County Middle School

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Facilitator Guide

Lesson 1: Know Your Local Farmers and What They Do For You

Lesson Outcomes

1. Define consumer products and know the importance of agriculture and agriculture products in a healthy community.
   Contributing activities
   - PowerPoint®
   - Activity sheet 1-1
   - Handout 1-1
   - Activity sheet 1-2

2. Identify the importance of the occupation of farming.
   Contributing activities
   - PowerPoint®
   - Activity sheet 1-1
   - Handout 1-1
   - Activity sheet 1-2
   - Activity sheet 1-4
   - Activity sheet 1-5

3. Identify the MyPlate food groups and foods in each group.
   Contributing activities
   - Activity sheet 1-2
   - Worksheet NEP-201C
   - Activity sheet 1-6

4. Know the appropriate quantities of foods from each food group to eat daily for optimal health.
   Contributing activities
   - Worksheet NEP-201C
   - Activity sheet 1-3

5. List products from each food group grown by Kentucky farmers.
   Contributing activities
   - Activity sheet 1-2
   - Activity sheet 1-6

6. Identify the skills farmers need to be successful.
   Contributing activities
   - Activity sheet 1-5

Materials and Equipment

- Projector (Some way to present a PowerPoint®. If the PowerPoint® cannot be presented make copies of presentation to pass out)
- Kentucky Farm 2 School introductory PowerPoint® presentation. Know Your Local Farmers and What They Do for You
- Activity sheet 1-1 – What Do Farmers Have to Do with It? (Consumer Goods)
- Handout 1-1 - Agricultural Content of Common Household Consumer Products
- Activity sheet 1-2 – Focus on Food & Farming
- MyPlate Worksheet NEP-201C
Lesson Initiation

Bell ringer/class opener:

Slide 1 - write on the board or tell students to describe what “Kentucky Farmer” means to them. Have them put away their response and save for later use. (This same question will be asked at the beginning of lesson 8, giving students a chance to evaluate the change in their description.)

Lesson Introduction

Slide 2 - What is the definition of a consumer product?

Discuss student answers.

Slide 3 – Definition of a consumer product - Generally any tangible personal property for sale and used for personal, family, or household nonbusiness purposes.

Activity 1

Use activity sheet 1-1, What Do Farmers Have to Do With It? In the first column have students write down all the consumer goods they used yesterday, from the time they got up to the time they went to bed. (allow 5 to 10 minutes.) Students may need some help to recall the many consumer products used daily. Ask questions such as, “Did you brush your teeth? What did you use?” “What did you wear?” In the second column have students answer, yes or no, whether those consumer products were produced by a farmer (see Handout 1–1 Agricultural Content of Common Household Consumer Products.) In the third column, have students answer, yes, no, or maybe, whether those products were produced by a Kentucky farmer. Discuss consumer products and farmer

Additional Resources

Your Food Environment Atlas [http://www.ers.usda.gov/foodatlas/] (abilities of communities to access healthy foods)

Consumer Reports.Org [www.consumerreports.org] (information on consumables)


Fresh Food Central [http://www.freshfoodcentral.com/] (fruits and vegetable information)


Free IPod, IPhone, and IPad App We Grow It Do You Know It [http://ianrhome.unl.edu/mobileapps/growitknowit]

More resources listed at the end of this lesson.
involvement. During the discussion ask students to identify which type of farmer helped produce the individual product(s). Introduce Free IPod, IPhone, and IPad App “We Grow It Do You Know It” [http://ianrhome.unl.edu/mobileapps/growitknowit]. The App is a good tool for students to use when sourcing food.

Slide 4 – Let students know that you are going to focus only on one part of consumer goods; FOOD! Review with students some basic information about MyPlate and its food groups. There are five major food groups. Have the students name them: grains, vegetables, fruits, dairy, and protein groups. Oils are also included in the Food Guide Pyramid. Discuss which foods are included in each group of MyPlate. MyPlate focuses on a personal approach by allowing individuals to determine appropriate calorie intake by age, gender, and activity level.

Activity 2

Use activity sheet 1-2, Focus on Food & Farming. Have students list foods they consumed the previous day, along with the serving sizes, in column one. Help them think of everything they ate from the time they got up until they went to bed. Ask questions such as, “Did you eat breakfast? What did you have? How much did you eat? What kind of milk did you drink? Did you add butter to your bread? Did you have any snacks?” In column two, have students classify the foods they ate into food groups on the MyPlate chart. In column three, have students identify with a yes or no which foods were grown or produced by Kentucky farmers. Review the student’s answers, as a group discussion, checking to make sure foods were classified into the correct MyPlate group, the serving sizes were correct, and they have properly identified which foods were produced by Kentucky farmers. An additional topic that could be discussed is which type of Kentucky farmer produced the foods. Save the students answers to compare with student answers at the end of the curriculum.

Activity 3

Choose from one of the three MyPlate activities and have students complete: MyPlate worksheet NEP-201C or log on to SuperTracker to Create Your Profile [https://www.choosemyplate.gov/SuperTracker/createprofile.aspx]. Students will determine their recommended calorie level and food intake from each food group. Make sure students compare their actual intake from activity sheet 1-2 with their recommended MyPlate eating plan. (Have students save this information for reference with future lessons throughout the curriculum.)

Activity 4

Use activity sheet 1-3, Create a Serving Size Kit. Follow directions to guide students through the creation of their own kit to demonstrate standard serving sizes as recognized by the USDA Dietary Guidelines for Americans.

Activity 5

Use activity sheet 1-4, Hometown City Exercise. This can be done individually or as a group project. Have students complete all transactions to identify the economic impact of buying locally.

Slide 5 – (Script) We have talked about consumer goods, food categories of MyPlate, and different types of food produced by different kinds of farmers. Now I want you to think of all the different skills
and knowledge these farmers need in order to succeed and/or make a profit. What occupations are associated with the different skills and knowledge needed to be a successful farmer?

Ask students to list all the occupations they think are associated with farming. Have a group discussion and list the occupations and skills needed on the board or have a volunteer write them down and repeat the list back to the class.

Example occupations:

- Ecologist
- Nutritionist (For humans and farm animals)
- Accountant
- Manager
- Food processor
- Transportation specialist
- Weather forecaster
- Economist
- Veterinarian
- Inspector
- Horticulturist
- Animal scientist (animal production, animal nutrition, dairy production, equine production, etc.)
- Aquaculturist
- Biologist
- Soil specialist
- Chemist

Farming skills are not limited to the occupations listed; there are many more that students can list. If students list other occupations have them explain and/or give an explanation to verify.

Activity 6

Use activity sheet 1-5, What is a Farmer to Do? This can be done individually or as a group project. Have students formulate a farm plan that can be used to solve the new owners’ problems. (Optional) Have students list the skills and knowledge they had to have/use to solve the problem. Once the students have completed the farm exercise, have them compare it to the bell ringer/class opener to see if they still have the same ideas about Kentucky farmers.

Additional Activities:

Use activity sheet 1-6, Making a Kentucky Menu. Have students develop a full menu, (breakfast, lunch, dinner, and snacks) to meet the requirements of their MyPlate eating plan, using as many Kentucky-grown products as possible. (Objective 3 and 5 contributing activity)

Activity- Have students create or alter a recipe for use of Kentucky-grown products. Have students prepare recipes in the classroom or at home and do a group taste test. (Objective 4 contributing activity)
## Kentucky Core Academic Standards

### Reading Informational

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI.9-10.1</td>
<td>Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</td>
</tr>
</tbody>
</table>

### Reading Science & other Technical

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RST.9-10.1</td>
<td>Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</td>
</tr>
<tr>
<td>RST.9-10.2</td>
<td>Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</td>
</tr>
<tr>
<td>RST.9-10.3</td>
<td>Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</td>
</tr>
<tr>
<td>RST.9-10.7</td>
<td>Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.</td>
</tr>
<tr>
<td>RST.9-10.9</td>
<td>Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.</td>
</tr>
</tbody>
</table>

### Writing

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.9-10.7</td>
<td>Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>W.9-10.8</td>
<td>Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</td>
</tr>
</tbody>
</table>

### Writing Science & other Technical

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHST.9-10.7</td>
<td>Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>WHST.9-10.8</td>
<td>Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</td>
</tr>
<tr>
<td>WHST.9-10.9</td>
<td>Draw evidence from informational texts to support analysis, reflection, and research.</td>
</tr>
</tbody>
</table>

### Speaking & Listening

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL.9-10.4</td>
<td>Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.</td>
</tr>
</tbody>
</table>
# Kentucky Farm 2 School
## Grades 11-12: Lesson 1
### Introducing Farm 2 School

<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Informational</strong></td>
</tr>
<tr>
<td>RI.11-12.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.</td>
</tr>
<tr>
<td>RI.11-12.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).</td>
</tr>
<tr>
<td>RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</td>
</tr>
<tr>
<td><strong>Reading Science &amp; other Technical</strong></td>
</tr>
<tr>
<td>RST.11-12.1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</td>
</tr>
<tr>
<td>RST.11-12.2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</td>
</tr>
<tr>
<td>RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</td>
</tr>
<tr>
<td>RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</td>
</tr>
<tr>
<td>RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</td>
</tr>
<tr>
<td>RST.11-12.8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</td>
</tr>
<tr>
<td>RST.11-12.9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
</tr>
<tr>
<td>W.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>W.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</td>
</tr>
</tbody>
</table>
| Writing Science & other Technical | WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
WHST.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.  
WHST.11-12.9. Draw evidence from informational texts to support analysis, reflection, and research. |
| Speaking & Listening | SL.11-12.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.  
SL.11-12.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks |
Know your local farmers and what they do for you

What is the definition of a consumer product?

Consumer Products?
Generally any tangible personal property for sale that is used for personal, family, or household non-business purposes.
### What Do Farmers Have to Do with It?

**Consumer Products**

<table>
<thead>
<tr>
<th>CONSUMER PRODUCTS USED</th>
<th>PRODUCED BY A FARMER YES/NO</th>
<th>PRODUCED BY A KENTUCKY FARMER YES/NO/MAYBE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL NUMBER OF CONSUMER PRODUCTS</th>
<th>TOTAL NUMBER PRODUCED BY A FARMER</th>
<th>TOTAL NUMBER PRODUCED BY A KENTUCKY FARMER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
## Agricultural Content of Common Household Consumer Products

<table>
<thead>
<tr>
<th>CONSUMER PRODUCT</th>
<th>AGRICULTURAL INGREDIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesives</td>
<td>Citrus oils, soybeans, chicken feathers, pork, beef</td>
</tr>
<tr>
<td>Antifreeze</td>
<td>Pork</td>
</tr>
<tr>
<td>Asphalt</td>
<td>Beef</td>
</tr>
<tr>
<td>Automobiles</td>
<td>Soybeans (lubricants, plastics, tires, foam)</td>
</tr>
<tr>
<td>Batteries</td>
<td>Corn starch</td>
</tr>
<tr>
<td>Bed linens and table linens</td>
<td>Cotton, linen</td>
</tr>
<tr>
<td>Bone china</td>
<td>Pork, beef</td>
</tr>
<tr>
<td>Bookbinding</td>
<td>Corn starch</td>
</tr>
<tr>
<td>Candles</td>
<td>Beef</td>
</tr>
<tr>
<td>Ceiling tile</td>
<td>Corn starch</td>
</tr>
<tr>
<td>Chalk</td>
<td>Corn Starch, pork</td>
</tr>
<tr>
<td>Clothing</td>
<td>Cotton, linen, wool, leather, silk, goose down</td>
</tr>
<tr>
<td>Crayons</td>
<td>Corn Starch, beef</td>
</tr>
<tr>
<td>Disposable diapers</td>
<td>Corn starch</td>
</tr>
<tr>
<td>Dyes</td>
<td>Corn Starch, pork</td>
</tr>
<tr>
<td>Food</td>
<td>Grains, fruits, vegetables, meats, vegetable oils, dairy products</td>
</tr>
<tr>
<td>Fuel filters, water filters</td>
<td>Corn starch, pork</td>
</tr>
<tr>
<td>Health and beauty products</td>
<td>Vegetable and fruit oils, minerals, flowers, herbs, corn starch, beef</td>
</tr>
<tr>
<td>Household cleaners and polishes</td>
<td>Citrus oils, beef</td>
</tr>
<tr>
<td>Inks</td>
<td>Soybeans</td>
</tr>
<tr>
<td>Insecticide</td>
<td>Beef</td>
</tr>
<tr>
<td>Insulation</td>
<td>Pork</td>
</tr>
<tr>
<td>Lubricants</td>
<td>Soybeans</td>
</tr>
<tr>
<td>Makeup</td>
<td>Vegetable oils, minerals, flowers, fish scales, corn starch, beef</td>
</tr>
<tr>
<td>Matches</td>
<td>Pork</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Medications</td>
<td>Corn starch, pork</td>
</tr>
<tr>
<td>Paint and Coatings</td>
<td>Vegetable oils, beef</td>
</tr>
<tr>
<td>Pesticides</td>
<td>Citrus oils</td>
</tr>
<tr>
<td>Photographic film</td>
<td>Beef</td>
</tr>
<tr>
<td>Pillows and comforters</td>
<td>Goose down</td>
</tr>
<tr>
<td>Plastics</td>
<td>Soybeans, chicken feathers, beef</td>
</tr>
<tr>
<td>Rubber, tires</td>
<td>Corn starch</td>
</tr>
<tr>
<td>Shoes and boots</td>
<td>Leather</td>
</tr>
<tr>
<td>Shoe polish</td>
<td>Corn syrup</td>
</tr>
<tr>
<td>Soap</td>
<td>Vegetable and animal fat</td>
</tr>
<tr>
<td>Stain removers</td>
<td>Citrus oils</td>
</tr>
<tr>
<td>Towels</td>
<td>Cotton</td>
</tr>
<tr>
<td>Upholstery</td>
<td>Pork</td>
</tr>
</tbody>
</table>


National Institute of Food and Agriculture. (n.d.). *Beyond the beef*. Retrieved from [http://forces.si.edu/main/pdf/6-8-BeyondTheBeef.pdf](http://forces.si.edu/main/pdf/6-8-BeyondTheBeef.pdf)
Focus on Food and Farming

Food Sourcing – is knowing the beginning or place of origin of the food you consume. The origin of the food in its simplest form.

Examples:

• A red delicious apple can come from a Kentucky orchard or from a New York orchard

• Thick and juicy rib-eye steak could have come from the black angus cattle farm just outside of Lexington, Kentucky or it could have come from a cattle feed lot in Oklahoma.

Remember most food travels 1,500 miles before it gets to your plate! Looking at the food label can help you determine if your product is local (Kentucky Proud – any agricultural product grown, raised, produced, processed, or manufactured in Kentucky [Branscum, 2012]) or if it is transported into the state of Kentucky from another state or country. Food labels provide the name and address of the processor or distributor.
<table>
<thead>
<tr>
<th>FOOD EATEN &amp; SERVING SIZE</th>
<th>IDENTIFY THE MYPLATE GROUP. Grain, vegetable, fruit, dairy, protein</th>
<th>DID YOU SOURCE THIS FOOD ITEM?</th>
<th>PRODUCED BY A KENTUCKY FARMER KENTUCKY PROUD YES/NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAKFAST</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LUNCH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DINNER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNACKS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OILS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISCRETIONARY CALORIES</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMPLETE ACTIVITY SHEET TOTALS ON NEXT PAGE.
### Bread Group:
- 1 oz equivalent is:
  - 1 slice bread
  - ½ bun or bagel
  - ½ cup cooked cereal, rice or pasta
  - 1 oz (about 1 cup) dry cereal

### Vegetable:
- 1 cup is:
  - 1 cup fresh, frozen or canned vegetables
  - 2 cups raw, leafy greens
  - 1 cup vegetable juice

### Fruit:
- 1 cup is:
  - 1 cup of fresh, canned, or frozen fruit
  - 1 medium whole fruit
  - 1 cup juice
  - ½ cup dried fruit

### Protein Group:
- 1 oz. equivalent is:
  - 1 oz. cooked meat, poultry or fish
  - 1/4 cup cooked beans
  - 1 tbsp peanut butter
  - 1 egg
  - ½ oz. nuts or seeds

### Dairy:
- 1 cup is:
  - 1 cup of milk or yogurt
  - 1 ½ oz of natural cheese
  - 2 oz of process cheese

---

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
MyPlate Worksheet

NAME ________________________________

1. Use the information from Table 1 (page 2) to help you estimate your daily caloric needs.
   • Use the appropriate chart for your gender/sex.
   • Determine which column to use, according to your activity level (sedentary, moderately active, active). (Definitions for activity levels follow the table.)
   • Determine which row to use, according to your age.

   I should eat about ________ calories each day.

2. Use the information from Table 2 (page 3) to determine how much you should eat from each food group. Record that information in the recommended amount column in the “Food Intake Record” below.

3. Consult your “24-Hour Food Recall Form” to see how much you ate from each food group on that day. Record that information in the amount eaten column in the “Food Intake Record” below.

4. Compare the figures in the recommended amount column with those in the amount eaten column. How can you improve your diet?

Food Intake Record

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Recommended Amount</th>
<th>Amount Eaten</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dairy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oils</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empty Calories Limit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Use the information in Table 3 to determine how much of the following you need on a weekly basis.

   I need _____ cups of dark green vegetables each week.
   I need _____ cups of orange vegetables each week.
   I need _____ cups of dry beans and peas each week.
   I need _____ cups of starchy vegetables each week.
Table 1. Food Intake Pattern Calorie Levels*

<table>
<thead>
<tr>
<th>Age</th>
<th>Activity level</th>
<th>Males</th>
<th></th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sedentary¹</td>
<td>Mod.active²</td>
<td>Active³</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1200</td>
<td>1400</td>
<td>1400</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1200</td>
<td>1400</td>
<td>1600</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1200</td>
<td>1400</td>
<td>1600</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1400</td>
<td>1600</td>
<td>1800</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1400</td>
<td>1600</td>
<td>1800</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1400</td>
<td>1600</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1600</td>
<td>1800</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1600</td>
<td>1800</td>
<td>2200</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1600</td>
<td>2000</td>
<td>2200</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1800</td>
<td>2200</td>
<td>2400</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>2000</td>
<td>2200</td>
<td>2600</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2000</td>
<td>2400</td>
<td>2800</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>2200</td>
<td>2600</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>16-18</td>
<td>2400</td>
<td>2800</td>
<td>3200</td>
<td></td>
</tr>
<tr>
<td>19-24</td>
<td>2600</td>
<td>2800</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>2600</td>
<td>2800</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>26-28</td>
<td>2400</td>
<td>2800</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>29-30</td>
<td>2400</td>
<td>2600</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>31-32</td>
<td>2400</td>
<td>2600</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>33-37</td>
<td>2400</td>
<td>2600</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>38-46</td>
<td>2400</td>
<td>2600</td>
<td>2800</td>
<td></td>
</tr>
<tr>
<td>47-49</td>
<td>2200</td>
<td>2600</td>
<td>2800</td>
<td></td>
</tr>
<tr>
<td>50-52</td>
<td>2200</td>
<td>2400</td>
<td>2800</td>
<td></td>
</tr>
<tr>
<td>53-57</td>
<td>2200</td>
<td>2400</td>
<td>2800</td>
<td></td>
</tr>
<tr>
<td>58-60</td>
<td>2200</td>
<td>2400</td>
<td>2600</td>
<td></td>
</tr>
<tr>
<td>61-67</td>
<td>2200</td>
<td>2400</td>
<td>2600</td>
<td></td>
</tr>
<tr>
<td>68-69</td>
<td>2000</td>
<td>2400</td>
<td>2600</td>
<td></td>
</tr>
<tr>
<td>70-78</td>
<td>2000</td>
<td>2200</td>
<td>2600</td>
<td></td>
</tr>
<tr>
<td>79 —</td>
<td>2000</td>
<td>2200</td>
<td>2400</td>
<td></td>
</tr>
</tbody>
</table>


¹ Sedentary = less than 30 minutes a day of moderate physical activity in addition to daily activities.
² Mod. Activity = at least 30 minutes up to 60 minutes a day of moderate physical activity in addition to daily activities.
³ Active = 60 or more minutes a day of moderate physical activity in addition to daily activities.
### Table 2. Daily Amount of Food from Each Food Group

<table>
<thead>
<tr>
<th>Calorie Level</th>
<th>Fruits</th>
<th>Vegetables</th>
<th>Grains</th>
<th>Protein</th>
<th>Dairy</th>
<th>Oils</th>
<th>Empty Calories Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>1 cup</td>
<td>1 cup</td>
<td>3 oz-eq</td>
<td>2 oz-eq</td>
<td>2 cups</td>
<td>3 tsp</td>
<td>140</td>
</tr>
<tr>
<td>1,200</td>
<td>1 cup</td>
<td>1.5 cups</td>
<td>4 oz-eq</td>
<td>3 oz-eq</td>
<td>2.5 cups</td>
<td>4 tsp</td>
<td>120</td>
</tr>
<tr>
<td>1,400</td>
<td>1.5 cups</td>
<td>1.5 cups</td>
<td>5 oz-eq</td>
<td>4 oz-eq</td>
<td>2.5 cups</td>
<td>4 tsp</td>
<td>120</td>
</tr>
<tr>
<td>1,600</td>
<td>1.5 cups</td>
<td>2 cups</td>
<td>5 oz-eq</td>
<td>5 oz-eq</td>
<td>3 cups</td>
<td>5 tsp</td>
<td>120</td>
</tr>
<tr>
<td>1,800</td>
<td>1.5 cups</td>
<td>2.5 cups</td>
<td>6 oz-eq</td>
<td>5 oz-eq</td>
<td>3 cups</td>
<td>5 tsp</td>
<td>160</td>
</tr>
<tr>
<td>2,000</td>
<td>2 cups</td>
<td>2.5 cups</td>
<td>6 oz-eq</td>
<td>5.5 oz-eq</td>
<td>3 cups</td>
<td>6 tsp</td>
<td>260</td>
</tr>
<tr>
<td>2,200</td>
<td>2 cups</td>
<td>3 cups</td>
<td>7 oz-eq</td>
<td>6 oz-eq</td>
<td>3 cups</td>
<td>6 tsp</td>
<td>270</td>
</tr>
<tr>
<td>2,400</td>
<td>2 cups</td>
<td>3 cups</td>
<td>8 oz-eq</td>
<td>6.5 oz-eq</td>
<td>3 cups</td>
<td>7 tsp</td>
<td>330</td>
</tr>
<tr>
<td>2,600</td>
<td>2 cups</td>
<td>3.5 cups</td>
<td>9 oz-eq</td>
<td>6.5 oz-eq</td>
<td>3 cups</td>
<td>8 tsp</td>
<td>360</td>
</tr>
<tr>
<td>2,800</td>
<td>2.5 cups</td>
<td>3.5 cups</td>
<td>10 oz-eq</td>
<td>7 oz-eq</td>
<td>3 cups</td>
<td>8 tsp</td>
<td>400</td>
</tr>
<tr>
<td>3,000</td>
<td>2.5 cups</td>
<td>4 cups</td>
<td>10 oz-eq</td>
<td>7 oz-eq</td>
<td>3 cups</td>
<td>10 tsp</td>
<td>460</td>
</tr>
<tr>
<td>3,200</td>
<td>2.5 cups</td>
<td>4 cups</td>
<td>10 oz-eq</td>
<td>7 oz-eq</td>
<td>3 cups</td>
<td>11 tsp</td>
<td>600</td>
</tr>
</tbody>
</table>

**Fruits**: 1 cup fruit or 100% fruit juice or ½ cup dried fruit = 1 cup fruit.

**Vegetables**: 1 cup raw or cooked vegetables or vegetable juice, or 2 cups of raw leafy greens = 1 cup vegetables.

**Grains**: 1 slice bread, 1 cup ready-to-eat cereal, or ½ cup cooked rice, pasta, or cooked cereal = 1 ounce grains.

At least half of all grains consumed should be whole grains.

**Protein**: 1 ounce lean meat, poultry, or fish, 1 egg, 1 Tbsp. peanut butter, ¼ cup cooked dry beans, or ½ ounce of nuts or seeds = 1 ounce meat and beans.

**Dairy**: 1 cup of milk or yogurt, 1.5 ounces of natural cheese, or 2 ounces of process cheese = 1 cup milk.

**Empty Calories Limit**: Calories from solid fats and added sugars should not be more than 5 to 15% of total calories.

### Table 3. Vegetable Subgroup Amounts are Per Week

<table>
<thead>
<tr>
<th>Calorie Level</th>
<th>Dark green vegetables</th>
<th>Orange vegetables</th>
<th>Dry Beans and Peas</th>
<th>Starchy vegetables</th>
<th>Other vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>0.5 c/wk</td>
<td>2.5 c/wk</td>
<td>0.5 c/wk</td>
<td>2 c/wk</td>
<td>1.5 c/wk</td>
</tr>
<tr>
<td>1,200</td>
<td>1 c/wk</td>
<td>3 c/wk</td>
<td>0.5 c/wk</td>
<td>3.5 c/wk</td>
<td>2.5 c/wk</td>
</tr>
<tr>
<td>1,400</td>
<td>1 c/wk</td>
<td>3 c/wk</td>
<td>0.5 c/wk</td>
<td>3.5 c/wk</td>
<td>2.5 c/wk</td>
</tr>
<tr>
<td>1,600</td>
<td>1.5 c/wk</td>
<td>4 c/wk</td>
<td>1 c/wk</td>
<td>4 c/wk</td>
<td>3.5 c/wk</td>
</tr>
<tr>
<td>1,800</td>
<td>1.5 c/wk</td>
<td>5.5 c/wk</td>
<td>1.5 c/wk</td>
<td>5 c/wk</td>
<td>4 c/wk</td>
</tr>
<tr>
<td>2,000</td>
<td>1.5 c/wk</td>
<td>5.5 c/wk</td>
<td>1.5 c/wk</td>
<td>5 c/wk</td>
<td>4 c/wk</td>
</tr>
<tr>
<td>2,200</td>
<td>2 c/wk</td>
<td>6 c/wk</td>
<td>2 c/wk</td>
<td>6 c/wk</td>
<td>5 c/wk</td>
</tr>
<tr>
<td>2,400</td>
<td>2 c/wk</td>
<td>6 c/wk</td>
<td>2 c/wk</td>
<td>6 c/wk</td>
<td>5 c/wk</td>
</tr>
<tr>
<td>2,600</td>
<td>2.5 c/wk</td>
<td>7 c/wk</td>
<td>2.5 c/wk</td>
<td>7 c/wk</td>
<td>5.5 c/wk</td>
</tr>
<tr>
<td>2,800</td>
<td>2.5 c/wk</td>
<td>7 c/wk</td>
<td>2.5 c/wk</td>
<td>7 c/wk</td>
<td>5.5 c/wk</td>
</tr>
<tr>
<td>3,000</td>
<td>2.5 c/wk</td>
<td>7.5 c/wk</td>
<td>3 c/wk</td>
<td>8 c/wk</td>
<td>7 c/wk</td>
</tr>
<tr>
<td>3,200</td>
<td>2.5 c/wk</td>
<td>7.5 c/wk</td>
<td>3 c/wk</td>
<td>8 c/wk</td>
<td>7 c/wk</td>
</tr>
</tbody>
</table>
Create a Serving Size Kit

Activity:
It can be difficult for students to visualize what 1 cup of cereal or 3 ounces of meat look like. During this activity, students can create their own kit for estimating serving sizes so they can more accurately determine what they are eating. The serving kit may be made during the first lesson and used throughout the curriculum. An alternative is to make only the parts of the kit that are useful to each lesson at the time the lesson is delivered.

Materials:
• Dry measuring cups: ¼ cup, ½ cup, 1 cup
• Dry beans or peas (1 ¾ cups per student)
• Stretchy material such as tulle, plastic netting or sealable plastic bags (three per student)
• Rubber bands, twisties, or other fastener (three per student)
• Decks of playing cards (one per student)
• Match boxes (one per student)
• Colored paper, scissors, clear tape
• Thin plastic, vinyl, or light cardboard that can be easily cut
• Set of patterns with key card (one per student)
• Markers
• Hole punchers
• Key rings

Optional:
• Liquid measuring cup
• 6-ounce coffee cup
• 9-inch dinner plate
• Drinking cups in 8-ounce, 12-ounce, 16-ounce, and 32-ounce sizes
• Tennis ball

Directions:
Measure 1 cup of dry beans or peas, leveling the top of the cup. Wrap the beans or peas loosely in netting or tulle and fasten securely, making sure the beans or peas have plenty of room to flow within the bag. Alternately, the beans or peas may be poured into a sealable plastic bag, making sure air is expressed from the bag before sealing. Repeat the process, measuring ½ cup of dry beans or peas, and ¼ cup of dry beans and peas.
Wrap a deck of cards in colored paper and secure it with clear tape. Label it, “3 Ounces.” Wrap a matchbox in colored paper and secure it with scotch tape. Label it, “1 Ounce.” Have the students cut out the patterns that follow and trace the shapes onto the plastic, vinyl or cardboard. Shapes should be labeled, and then cut. Cardboard shapes can be laminated for durability. The key card may be cut out and fixed to cardboard or copied onto heavier paper and laminated. Have the students use the hole punch to make a hole in the corner of each shape and the key card, then string the shapes and key card onto the key ring.

Use the liquid measuring cup, assorted drinking cups, and plates to demonstrate standard serving sizes. Show the students that a standard coffee cup holds 6 ounces, while a coffee shop serving may be 10 or 12 ounces. A standard dinner plate is 9 inches in diameter, although many restaurants serve from 12-inch plates. An average piece of fruit, such as an apple, should be about the size of a tennis ball.

Discussion:
The 1-cup bag of dried beans illustrates how a cup of pasta would look on your plate.
Patterns for Portion Kit

**KEY TO FOOD RECALL KIT SAMPLES**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Example to measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 1” square</td>
<td>1” cube cheese</td>
</tr>
<tr>
<td>B. 2” square</td>
<td>brownies</td>
</tr>
<tr>
<td>C. 3” square</td>
<td>1/9 of a 9” sheet cake</td>
</tr>
<tr>
<td>D. 4”square</td>
<td>¼ of an 8” square cake</td>
</tr>
<tr>
<td>E. 1/16 of a layer cake</td>
<td>cake</td>
</tr>
<tr>
<td>F. 1/12 of a layer cake</td>
<td>cake</td>
</tr>
<tr>
<td>G. 1/8 of a 9” pie</td>
<td>pie, quiche</td>
</tr>
<tr>
<td>H. 1/6 of a 9” pie</td>
<td>pie, quiche</td>
</tr>
<tr>
<td>I. 4” circle</td>
<td>danish, pancake</td>
</tr>
<tr>
<td>J. 6” circle</td>
<td>large pancake</td>
</tr>
<tr>
<td>K. ⅛ of 12” pizza</td>
<td>pizza</td>
</tr>
</tbody>
</table>
Hometown City Exercise

The multiplier effect describes how an increase in some economic activity starts a chain reaction that generates more activity than the original increase; an effect in economics in which an increase in spending produces an increase in national income and consumption greater than the initial amount spent. For example, if a corporation builds a factory, it will employ construction workers and their suppliers as well as those who work in the factory. Indirectly, the new factory will stimulate employment in laundries, restaurants, and service industries in the factory’s vicinity.

Part 1

The instructor will assign students to act as the following community members and business entities with funds as specified:

<table>
<thead>
<tr>
<th>Entity</th>
<th>Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>School board</td>
<td>$100,000</td>
</tr>
<tr>
<td>Grocery store</td>
<td>$50,000</td>
</tr>
<tr>
<td>Restaurant, sit down</td>
<td>$10,000</td>
</tr>
<tr>
<td>Restaurant, fast food</td>
<td>$12,000</td>
</tr>
<tr>
<td>Caterer</td>
<td>$2,000</td>
</tr>
<tr>
<td>Shoe store</td>
<td>$25,000</td>
</tr>
<tr>
<td>Book store</td>
<td>$25,000</td>
</tr>
<tr>
<td>Drug store</td>
<td>$40,000</td>
</tr>
<tr>
<td>Movie theatre</td>
<td>$30,000</td>
</tr>
<tr>
<td>Clothing store</td>
<td>$30,000</td>
</tr>
<tr>
<td>Hotel</td>
<td>$50,000</td>
</tr>
<tr>
<td>City government</td>
<td>$100,000</td>
</tr>
<tr>
<td>Hardware/appliance store</td>
<td>$40,000</td>
</tr>
<tr>
<td>Church</td>
<td>$35,000</td>
</tr>
<tr>
<td>Roller skating rink</td>
<td>$35,000</td>
</tr>
<tr>
<td>Factory</td>
<td>$90,000</td>
</tr>
<tr>
<td>Gas station/convenience store</td>
<td>$25,000</td>
</tr>
<tr>
<td>Dairy farmer</td>
<td>$2,000</td>
</tr>
<tr>
<td>Beef cattle farmer</td>
<td>$2,000</td>
</tr>
<tr>
<td>Vegetable farmer</td>
<td>$2,000</td>
</tr>
<tr>
<td>Teacher</td>
<td>$2,000</td>
</tr>
<tr>
<td>Grocery store worker</td>
<td>$900</td>
</tr>
<tr>
<td>Waitress</td>
<td>$500</td>
</tr>
<tr>
<td>Shoe store clerk</td>
<td>$1,000</td>
</tr>
<tr>
<td>Book store clerk</td>
<td>$1,000</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>$3,000</td>
</tr>
<tr>
<td>Medical doctor</td>
<td>$4,000</td>
</tr>
<tr>
<td>Dentist</td>
<td>$3,500</td>
</tr>
<tr>
<td>Gas station attendant</td>
<td>$500</td>
</tr>
<tr>
<td>Factory worker</td>
<td>$1,000</td>
</tr>
<tr>
<td>Bank</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

**TOTAL:** $822,400

Copyright © 2005 by Houghton Mifflin Company.
Published by Houghton Mifflin Company. All rights reserved.
Complete the following transactions in order, balancing the checkbook as you go. Record of Transactions, may be used to track payments and deposits.

<table>
<thead>
<tr>
<th>Transaction 1:</th>
<th>Transaction 5:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The city government collects $13,748 in taxes; 2% from everyone except the church and themselves.</td>
<td>The dairy farmer, vegetable farmer, beef farmer, teacher, grocery store worker, waitress, shoe store clerk, book store clerk, pharmacist, doctor, dentist, gas station attendant, and factory worker spend $120 each on food for the week at the grocery store.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transaction 2:</th>
<th>Transaction 6:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The school food service (school board) orders food for the following week: $2,000 meat from distributors in another city $1,000 milk from a national dairy chain $2,000 fruits and vegetables from a national food distributor $1,000 bread from a national distributor</td>
<td>The hotel is the site of a dental association conference. A. They order $5,000 in food from out-of-town distributors. B. The hotel earns $16,000 in room rental.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transaction 3:</th>
<th>Transaction 7:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The dairy farmer, vegetable farmer, beef farmer, teacher, grocery store worker, waitress, shoe store clerk, book store clerk, pharmacist, doctor, dentist, gas station attendant, and factory worker pay $10 to the school board for their kids’ lunches.</td>
<td>The dentist wants a new pair of shoes for the conference. He purchases a $120 pair of shoes from the shoe store.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transaction 4:</th>
<th>Transaction 8:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The grocery store orders $40,000 food from out-of-state distributors.</td>
<td>The dentist has friends coming to town for the conference. He plans a small party at his home and pays the caterer $500 to cater it.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transaction 9:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The caterer spends $200 at the grocery store on food for the party.</td>
<td></td>
</tr>
</tbody>
</table>
**Transaction 10:**
Professionals attending the conference spend $400 on gas at the gas station, $60 at the movie theatre, $300 at the clothing store, $70 at the book store, $120 at the sit-down restaurant, $80 at the fast food restaurant, and $25 at the drug store

**Transaction 11:**
The church collects $85 in offering. ($15 each from the dairy farmer, the beef cattle farmer, and the teacher, $10 from the factory worker, the shoe store clerk, and the pharmacist, and $5 from the waiter/waitress and the gas station attendant.)
## Answer Key Part 1

Report the amount of money the organization or individual has at the end of the part 1 transactions:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>School board</td>
<td>$92,130</td>
</tr>
<tr>
<td>Grocery store</td>
<td>$10,760</td>
</tr>
<tr>
<td>Restaurant, sit down</td>
<td>$9,920</td>
</tr>
<tr>
<td>Restaurant, fast food</td>
<td>$11,840</td>
</tr>
<tr>
<td>Caterer</td>
<td>$2,260</td>
</tr>
<tr>
<td>Shoe store</td>
<td>$24,620</td>
</tr>
<tr>
<td>Book store</td>
<td>$24,570</td>
</tr>
<tr>
<td>Drug store</td>
<td>$39,225</td>
</tr>
<tr>
<td>Movie theatre</td>
<td>$29,460</td>
</tr>
<tr>
<td>Clothing store</td>
<td>$29,700</td>
</tr>
<tr>
<td>Hotel</td>
<td>$60,000</td>
</tr>
<tr>
<td>City government</td>
<td>$113,748</td>
</tr>
<tr>
<td>Hardware/appliance store</td>
<td>$39,200</td>
</tr>
<tr>
<td>Church</td>
<td>$35,085</td>
</tr>
<tr>
<td>Roller skating rink</td>
<td>$34,300</td>
</tr>
<tr>
<td>Factory</td>
<td>$88,200</td>
</tr>
<tr>
<td>Gas station/convenience store</td>
<td>$24,900</td>
</tr>
<tr>
<td>Dairy farmer</td>
<td>$1,815</td>
</tr>
<tr>
<td>Beef cattle farmer</td>
<td>$1,815</td>
</tr>
<tr>
<td>Vegetable farmer</td>
<td>$1,830</td>
</tr>
<tr>
<td>Teacher</td>
<td>$1,815</td>
</tr>
<tr>
<td>Grocery store worker</td>
<td>$752</td>
</tr>
<tr>
<td>Waitress</td>
<td>$355</td>
</tr>
<tr>
<td>Shoe store clerk</td>
<td>$840</td>
</tr>
<tr>
<td>Book store clerk</td>
<td>$850</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>$2,800</td>
</tr>
<tr>
<td>Medical doctor</td>
<td>$3,790</td>
</tr>
</tbody>
</table>

**TOTAL:** $788,455
Part 2

Continue to act as community members and business entities with funds as specified at the beginning of part 1. Then complete the new transactions, balancing the checkbooks as you go:

Transaction 1:
The city government collects $13,748 in taxes; 2% from everyone except the church and themselves.

Transaction 2:
The school food service (school board) orders food for the following week:
- $1,000 beef from the local beef farmer and $1,000 meat from distributors in another city
- $1,000 milk from the local dairy farmer
- $1,500 fruits and vegetables from the local vegetable farmer and $500 from a national distributor
- $1,000 bread from a national distributor

Transaction 3:
The dairy farmer, vegetable farmer, beef farmer, teacher, grocery store worker, waitress, shoe store clerk, book store clerk, pharmacist, doctor, dentist, gas station attendant, and factory worker pay $10 to the school board for their kids' lunches.

Transaction 4:
The grocery store orders $7,000 beef from the local beef farmer, $8,000 milk from the local dairy farmer, $10,000 fruits and vegetables from the local vegetable farmer, and $15,000 food from out-of-state distributors.

Transaction 5:
The dairy farmer, vegetable farmer, beef farmer, teacher, grocery store worker, waitress, shoe store clerk, book store clerk, pharmacist, doctor, dentist, gas station attendant, and factory worker spend $120 each on food for the week at the grocery store.

Transaction 6:
A. The dairy farmer decides to expand his farming operations. He borrows $70,000 from the bank.
B. He pays an interest rate of 4%, and the bank sells his loan to another investor for $71,000.

Transaction 7:
The dairy farmer pays the gas station attendant $5,000 to provide part of the labor for framing up the expansion on his barn. The farmer also spends $11,000 at the hardware store on supplies and lumber.

Transaction 8:
The hotel is the site of a dental association conference. They order $1,500 worth of beef, $2,000 worth of vegetables and fruits, and $500 milk from the local farmers and $1,000 food from out-of-town distributors and make $16,000 in room rental.

Transaction 9:
The dentist wants a new pair of shoes for the conference. He purchases a $120 pair of shoes from the shoe store.
Transaction 10:
Business is good, so the shoe store clerk is given a raise of 50 cents per hour. This is about $80 per month.

Transaction 11:
The dentist has friends coming to town for the conference. He plans a big party at his home and pays the caterer $2,000 to cater it. The caterer spends $550 on food and supplies at the grocery store and pays the waitress $200 to help serve.

Transaction 12:
The caterer buys a new pair of shoes from the shoe store. They cost $80. The teacher, the doctor, and the pharmacist are all invited to the party and pay $135 each for new clothes.

Transaction 13:
The vegetable farmer’s daughter celebrates her 11th birthday with a party at the skating rink. The party costs $240. Guests spend $25 at the bookstore, $45 at the clothing store, $15 at the drug store and $15 at the movie theater on gifts.

Transaction 14:
Increased trucking from farms to institutions increases the demand for gasoline. The vegetable farmer spends $120 on gasoline, while the beef farmer spends $105 and the dairy farmer spends $70.

Transaction 15:
Professionals attending the conference spend $400 on gas at the gas station, $60 at the movie theatre, $300 at the clothing store, $70 at the book store, $120 at the sit-down restaurant, $80 at the fast-food restaurant, and $25 at the drug store.

Transaction 16:
The shoe store clerk takes his girlfriend, the grocery store worker, out to celebrate his raise. They spend $35 at the sit-down restaurant.

Transaction 17:
The church collects $125 in offering. ($20 each from the dairy farmer, the beef cattle farmer, and the teacher, $15 from the factory worker, the shoe store clerk, and the pharmacist, and $10 from the waitress and the gas station attendant.)
1. Did you have more money at the end of part 2 than you did at the end of part 1? If yes, how much?

(18 of the 31 organizations or individuals had more money at the end of part 2, when food was purchased from local farmers.)

2. Why did the community gain money when people purchased food locally?

• The community retained money that used to be spent in companies in other communities.
• Profits within the community stimulated additional business within the community (i.e., the purchase of additional gas, building supplies and services).

(Caution students that this is a simple and extreme demonstration. In reality, farmers would make money marketing their products to outside entities. However, higher shipping and marketing expenses could reduce profits.)

3. Are there other reasons to purchase food locally?

• Improved quality
• Improved nutrition
• Greater stability of the food supply
• Maintaining cultural heritage
• Others?
## Answer Key Part 2

Students should report the amount of money the organization or individual has at the end of the part 2 transactions:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>School board</td>
<td>$92,130</td>
</tr>
<tr>
<td>Grocery store</td>
<td>$11,110</td>
</tr>
<tr>
<td>Restaurant, sit down</td>
<td>$9,955</td>
</tr>
<tr>
<td>Restaurant, fast food</td>
<td>$11,840</td>
</tr>
<tr>
<td>Caterer</td>
<td>$3,130</td>
</tr>
<tr>
<td>Shoe store</td>
<td>$24,620</td>
</tr>
<tr>
<td>Book store</td>
<td>$24,595</td>
</tr>
<tr>
<td>Drug store</td>
<td>$39,240</td>
</tr>
<tr>
<td>Movie theatre</td>
<td>$29,475</td>
</tr>
<tr>
<td>Clothing store</td>
<td>$30,150</td>
</tr>
<tr>
<td>Hotel</td>
<td>$60,000</td>
</tr>
<tr>
<td>City government</td>
<td>$113,748</td>
</tr>
<tr>
<td>Hardware/appliance store</td>
<td>$50,200</td>
</tr>
<tr>
<td>Church</td>
<td>$35,125</td>
</tr>
<tr>
<td>Roller skating rink</td>
<td>$34,540</td>
</tr>
<tr>
<td>Factory</td>
<td>$88,200</td>
</tr>
<tr>
<td>Gas station/convenience store</td>
<td>$25,195</td>
</tr>
<tr>
<td>Dairy farmer</td>
<td>$62,440</td>
</tr>
<tr>
<td>Beef cattle farmer</td>
<td>$11,205</td>
</tr>
<tr>
<td>Vegetable farmer</td>
<td>$14,970</td>
</tr>
<tr>
<td>Teacher</td>
<td>$1,675</td>
</tr>
<tr>
<td>Grocery store worker</td>
<td>$752</td>
</tr>
<tr>
<td>Waitress</td>
<td>$550</td>
</tr>
<tr>
<td>Shoe store clerk</td>
<td>$880</td>
</tr>
<tr>
<td>Book store clerk</td>
<td>$850</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>$2,660</td>
</tr>
<tr>
<td>Medical doctor</td>
<td>$3,655</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td><strong>$889,255</strong></td>
</tr>
</tbody>
</table>

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
<table>
<thead>
<tr>
<th>Community/Member/Entity</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>School board</td>
<td>100,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grocery store</td>
<td>50,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurant, sit down</td>
<td>10,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caterer</td>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoe store</td>
<td>25,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Book store</td>
<td>40,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug store</td>
<td>30,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movie theater</td>
<td>30,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing store</td>
<td>50,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hotel</td>
<td>100,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City government</td>
<td>100,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware/Appliance store</td>
<td>40,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Church</td>
<td>35,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roller skating rink</td>
<td>90,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory</td>
<td>25,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dairy farmer</td>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beef cattle farmer</td>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable farmer</td>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grocery store worker</td>
<td>900</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waitress</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoe store clerk</td>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Book store clerk</td>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacist</td>
<td>3,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical doctor</td>
<td>4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentist</td>
<td>3,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas station attendant</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory worker</td>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank</td>
<td>100,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>822,400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Hometown City Activity Sheet Key

## LESSON 1

### ACTIVITY SHEET 1-4

<table>
<thead>
<tr>
<th>Community Type</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### School Board

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Grocery Store

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Restaurant, Sit Down

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Restaurant, Fast Food

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Caterer

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Shoe Store

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Book Store

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Drug Store

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Movie Theater

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Clothing Store

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Hotel

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Hardware/Appliance Store

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Church

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Roller Skating Rink

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Factory

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Gas Station/Convenience Store

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Dairy Farmer

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Beef Cattle Farmer

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Vegetable Farmer

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Teacher

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Grocery Store Worker

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Waitress

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Shoe Store Clerk

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Book Store Clerk

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Pharmacist

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Medical Doctor

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Dentist

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Gas Station Attendant

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Factory Worker

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Bank

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

### Total

<table>
<thead>
<tr>
<th>Category</th>
<th>Beginning Balance</th>
<th>Ending Balance</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
</table>

---

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
# Record of Transactions

<table>
<thead>
<tr>
<th>DATE</th>
<th>TRANSACTION DESCRIPTION</th>
<th>PAYMENT AMOUNT</th>
<th>DEPOSIT AMOUNT</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Starting Balance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

...
<table>
<thead>
<tr>
<th>DATE</th>
<th>TRANSACTION DESCRIPTION</th>
<th>PAYMENT AMOUNT</th>
<th>DEPOSIT AMOUNT</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What’s a Farmer to Do?

You have just inherited a Kentucky farm from your recently deceased aunt. The farm includes 150 acres, a tenant house, two barns, three ponds, 25 dairy cows, and a 25-head cow and calf operation. About 30 acres of the farm are good bottom land running along the Kentucky River. The rest of the land is fairly hilly; the soil on the hills is high in clay content and full of limestone rock. The accumulated farm equipment consists of a tractor, plow, disk, mower, rake, and baler. The dairy barn is fully equipped with a pipeline milking operation.

The tenant house is occupied by an elderly couple who take care of farm maintenance and the dairy operation. They live in the house rent-free and receive 50% of the milk profits.

With the inheritance of the farm you have also inherited the farm debt. The farm was originally purchased for $80,000 which was to be paid over a 30-year time period with a 4.5% interest rate. The debt is now $30,000, which is paid annually. The annual payment is $4864.20. (To figure monthly, divide by 12.)

As the beneficiary, you have to provide guidance about the management of the farm for it to be a profitable asset to you and your family. The farm is somewhat remote, so it has little development potential. You feel that the economic climate would make it difficult to sell the farm at this time so you must develop a farm plan. You currently have $20,000 of disposable income to use on this endeavor.

When research is complete, present the information to the class. Be prepared to answer questions about your presentation to help guide further development of the farm plan.

Things to consider when deciding which crops (if any) can be grown successfully on the farm:

1. Pests and diseases
2. Soil and terrain
3. Climate
4. Marketing (Initial investment, production cost, marketing costs, profit margin)

Any crops may be considered, but the following are commonly produced in Kentucky:

• **Vegetables:** bell peppers, corn, pumpkins, soybeans, tomatoes
• **Grains:** barley, corn, wheat, sorghum
• **Fruit:** apples, pears, peaches, plums, cherries
• **Miscellaneous:** tobacco, straw, hay
• **Livestock:** beef cattle, dairy cattle, chicken, goats, horses, mules, pigs, sheep
Recommended Resources

Vegetables:

Bell Pepper [http://www.uky.edu/Ag/NewCrops/introsheets/pepperintro.pdf](http://www.uky.edu/Ag/NewCrops/introsheets/pepperintro.pdf)

Sweet Corn [http://www.uky.edu/Ag/CDBREC/introsheets/sweetcorn.pdf](http://www.uky.edu/Ag/CDBREC/introsheets/sweetcorn.pdf)


Pumpkin [http://www.uky.edu/Ag/CDBREC/introsheets/pumpkinintro.pdf](http://www.uky.edu/Ag/CDBREC/introsheets/pumpkinintro.pdf)


Specialty Soybeans [http://www.uky.edu/Ag/NewCrops/introsheets/specialtysoy.pdf](http://www.uky.edu/Ag/NewCrops/introsheets/specialtysoy.pdf)

Department of Botany and Plant Pathology Purdue University [http://www.btny.purdue.edu/Extension/Pathology/CropDiseases/Soybean/Soybean.html](http://www.btny.purdue.edu/Extension/Pathology/CropDiseases/Soybean/Soybean.html)

Iowa State University Soybean Extension and Research Program [http://extension.agron.iastate.edu/soybean/production_planting.html](http://extension.agron.iastate.edu/soybean/production_planting.html)

NDSU Soybean Production [http://www.ag.ndsu.edu/pubs/plantsci/rowcrops/a250w.htm](http://www.ag.ndsu.edu/pubs/plantsci/rowcrops/a250w.htm)

Grains:

UK- A Comprehensive Guide to Wheat Management in Kentucky [http://www.uky.edu/Ag/GrainCrops/ID125Section8.html](http://www.uky.edu/Ag/GrainCrops/ID125Section8.html) (insect pests)

Barley Resources [www.extension.org/article/32488](http://www.extension.org/article/32488)

USDA New Feed Grains Data [www.ers.usda.gov/data/feedgrains/Table.asp?t=01](http://www.ers.usda.gov/data/feedgrains/Table.asp?t=01)


Fruit:


Apples [http://www.uky.edu/Ag/CDBREC/introsheets/apples.pdf](http://www.uky.edu/Ag/CDBREC/introsheets/apples.pdf)


Livestock:


When research is complete, present the information found to the class. Follow your presentation with a discussion of the following questions to help guide further development of the farm plan:

1. What commodity would be best suited to the physical climate and soil of your farm?

2. What kind of initial investments would be required to raise or produce your chosen commodity/commodities? What would the cost be?

3. How much time and labor would be required to raise and maintain the commodity? What is the cost of that time and labor?

4. Will the product need to be processed before sale? What are the costs of processing and transporting your finished product?

5. What certifications and insurance do you need to purchase? (e.g., farm insurance, crop insurance) (Some states require this; is Kentucky one of them?)

6. How will you market, sell, and transport your commodity? How much is the cost to complete each?
7. How much of a profit do you expect to make?

8. What are the actual profits and/or losses after expenses?

9. Food source for existing farm livestock? And cost?

10. Are there other issues that should be considered?

**Extended activity:**

For the assigned crops, you need to research the types of soil, climate, pests and diseases, and marketing issues associated with their crops.
Making a Kentucky Menu!

Develop a personal menu for one day, specific to your MyPlate eating plan, determined earlier in the lesson. Use only Kentucky products in your menu. (See rubric.)

The menu should contain:
• Breakfast
• Lunch
• Dinner
• Snacks
• Discretionary calories

Suggested resources:

Kentucky Market Maker
http://ky.marketmaker.uiuc.edu/

Kentucky Proud Product Search

Kentucky Proud Market
http://www.kentuckyproudmarket.com/
<table>
<thead>
<tr>
<th>Student Performance</th>
<th>Kentucky Products</th>
<th>MyPlate/Dietary Guidelines</th>
<th>Menu Sections</th>
<th>Effort/Creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distinguished</strong> 4</td>
<td>All foods are Kentucky products. Source of each Kentucky product is identified.</td>
<td>All food categories of MyPlate were used according to personal dietary guidelines and clearly marked. Personal dietary guidelines are attached to menu.</td>
<td>Menu has five sections clearly marked. (breakfast, lunch, dinner, snack, and discretionary calories)</td>
<td>Clear evidence of effort by student. Menu is neat, organized, colorful and creatively eye catching.</td>
</tr>
<tr>
<td><strong>Proficient</strong> 3</td>
<td>Most foods are Kentucky products. Source of most of the Kentucky products is identified.</td>
<td>Most food categories of MyPlate were used according to personal dietary guidelines and clearly marked. Personal dietary guidelines are attached to menu.</td>
<td>Menu has four sections clearly marked.</td>
<td>Some evidence of effort by student. Menu is somewhat neat, organized and creative.</td>
</tr>
<tr>
<td><strong>Apprentice</strong> 2</td>
<td>Some foods are Kentucky products. Some Kentucky food sources are identified.</td>
<td>Some food categories of MyPlate were used according to personal dietary guidelines but not clearly marked. Personal dietary guidelines are attached to menu.</td>
<td>Menu has at least three sections marked or more than three but is not clearly marked.</td>
<td>Some evidence of effort but the menu is not neat or creative.</td>
</tr>
<tr>
<td><strong>Novice</strong> 1</td>
<td>Kentucky foods are not identified. Sources are not identified.</td>
<td>MyPlate categories were not used correctly according to personal dietary guidelines and were not identified. Personal dietary guidelines were not attached to menu.</td>
<td>Menu has no sections.</td>
<td>No evidence of effort.</td>
</tr>
</tbody>
</table>

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
10 Good Reasons To Buy Locally Grown Food

1. Locally grown food tastes and looks better.
   It was grown close to home and served at peak freshness. It came from down the road, not from across the country or overseas.

2. Local food supports local families.
   When you buy Kentucky Proud food, you help local farm families make a living. Your business helps them pay the bills, put their kids through school, and stay on the farm.

3. Local food builds trust.
   In these days of concern for food safety and homeland security, it’s reassuring to look into the eyes of the person who grew your food and be able to drive past the field where it grew.

4. Local food shows you’re Kentucky Proud.
   Buying local food bearing the familiar Kentucky Proud logo gives this program more meaning. It encourages consumers to look for Kentucky Proud quality and businesses to supply it.

5. Local food preserves farmland.
   When farmers get more money for their products, they are less likely to sell their land for development.

6. Local food keeps taxes down.
   Several studies show that farms pay more in taxes than required in services, while most residential developments need more services than they pay for with their taxes.

7. Local food benefits the environment and wildlife.
   Kentucky farms nestle in a patchwork of fields, meadows, woods, streams, and ponds that provide vital habitat for wildlife.

8. Local food travels shorter distances from farm to plate.
   On average, food travels 1,500 miles from farm to plate. Each calorie requires an average 10 calories of fuel for travel, refrigeration, and processing. Locally grown food reduces the use of fossil fuels.

9. Local food preserves genetic diversity.
   Local farms often grow heirloom varieties of fruits and vegetables with superior flavor and nutritional value.

10. Local food is an investment in our future.
    When you buy from a local grower, you preserve the strength and character of your community for your children and grandchildren.

Kentucky Department of Agriculture
Farm To School Program

www.kyproud.com
For more information call: (502) 573-0282
LESSON 2
GRAINS

Jesse Day, 6th grade, Rockcastle County Middle School

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Lesson Outcomes:

1. Identify MyPlate grains group and which foods fit into this group.
   Contributing activities
   • Activity 1

2. List the roles of grains in the diet.
   Contributing activities
   • Activity 1
   • Activity 2
   • Handout 2-1
   • Activity 8

3. Identify serving sizes from the grain group.
   Contributing activities
   • Activity 3
   • Activity 4
   • Activity sheet 2-1
   • Activity 5
   • Activity sheet 1-3 (portion size kit from lesson 1)

4. Explain the difference between whole and refined grains.
   Contributing activities
   • Activity 6
   • Labeling and whole grain food PowerPoint® quiz
   • Handout 2-2
   • Activity 7
   • Activity sheet 2-2
   • Activity 8
   • Handout 2-3

5. Identify which grains are grown in Kentucky, and discuss the farming process from planting to consumption.
   Contributing activities
   • Activity 8
   • Activity 9
   • Handout 2-3
   • Activity 2-3

6. Identify producers and processors in Kentucky.
   Contributing activities
   • Activity 8
   • Activity 9
   • Activity 10
   • Activity sheet 2-3
   • Activity sheet 2-4

Materials and Equipment:

• Handout 2-1 Grain for Grain
• MyPlate Worksheet NEP-201C (completed in lesson 1)

(Optional) https://www.choosemyplate.gov/SuperTracker/createprofile.aspx

• Activity sheet 2-1 A Grain of Great Proportion
• Activity sheet 1-3 Portion Size Kit (from lesson 1)
• Handout 2-2 Refined or Not Refined
Activity sheet 2-2 Threshing With Feet?
  • Whole-grain seed (quantity will depend on class size)
  • Tarp or large bucket
  • Sandpaper

• Downloadable displays, “Whole Grains,”
  http://www.ca.uky.edu/HES/index.php?p=386 or printed copy of the displays

• Projector (for PowerPoint® quiz)

Lesson Initiation

Bell ringer/class opener:
Write on the board or ask students how many foods did you eat yesterday that contained grain.

Lesson Introduction

(Script) Last time we talked about the importance of farming and how farmers help us obtain food from each food group of MyPlate. What are the five food groups of MyPlate? (Grain, fruit, vegetable, dairy, proteins) Who can tell me what foods they have eaten today that might go into the grain group? (Raise your hand and wait to be called on so everyone can get a chance to be heard.)

Activity 1

Using students’ individual MyPlate information from lesson 1, have students calculate the number of servings from the grain group they need each day. (MyPyramid Worksheet NEP 201-C, or Steps to a Healthier You worksheet)

Activity 2

(Script) We need more servings from the grain group than any other group. Why? And what do these nutrients do for us? Which nutrients are provided and what do they provide for our bodies?

To help students answer these questions above follow the activity steps below.

• This activity can be done as a group activity using a flip chart or chalk board.

• Have groups brainstorm reasons why we need more servings from the grain group than other food groups, then have one person from each group write his or her best reason on the flip chart/chalk board.

• Re-write these reasons on individual flip chart pages or make columns on the chalk board.

• Have student groups brainstorm which nutrients are needed in each category and how the nutrient aids in completing the reason/category.

• Then have one student from each group list which nutrients are needed and how the nutrients aid in helping the body complete the task. (Handout 2-1 will help students with answers.)

Activity 3

(Script)
Q: How much is a serving size from the grains group?
A: There are different sizes for different types of grain foods. For instance, a piece of bread cannot be measured the same way pasta is measured.
Q: If I told you that one slice of bread is equal to one serving in the grains group, does that mean that one piece of pasta is one serving in the grains group?

A: You can have more than one piece of pasta. You can actually have 1/2 cup of pasta to equal one serving of food from the grain group.

Demonstrate by using food models if available. If not, use real food and measure several foods from the grains group (Examples: 1 slice of bread, ½ hamburger or hotdog bun, 1 small roll or biscuit, ½ cup cooked cereal, rice, or pasta, 1 cup of ready-to-eat cereal, 1 small waffle or pancake, 5 to 6 saltine crackers, 3 cups plain popcorn.) If the students made portion kits in the introductory unit, they may be used here.

**Activity 4**

Have students complete activity sheet 2-1, A Grain of Great Proportion. Ask students to list all of the foods from the grain group they ate yesterday in the first column of the worksheet. In column A, they should list the number of ounce equivalents of each food they ate. In column B, they should list the number of ounce equivalents considered to be a standard serving size. Activity Sheet 1-2 Food Recall Worksheet from the introductory unit may be used to help identify ounce equivalents. Once totaled, the students will be able to see the difference between the amount of grain products they are consuming and the amount they need.

**Optional Activity 5**

Portion size kit (This activity is continued through each lesson) art activity – Have students create their own portion size kits to help them estimate their servings of grains, following directions in activity sheet 1-3 of the introductory lesson 1.

Parts of the kit relevant to the grains group include ½ cup for pasta or cooked cereal, 1 cup for dry cereal, 4-inch circle for small pancake, 6-inch circle for large pancake, and ¼ of a 12-inch pizza. (This activity is offered for each lesson, so the entire portion size kit is created by the end of the curriculum)

**Activity 6**

Use handout 2-2 Refined or Not Refined (Script)

*Let’s do an activity to show the difference between refined grain and whole-grain. We are going to take a quiz together and see how we do when it comes to labeling and choosing whole-grain products.*

Labeling and whole-grain food PowerPoint® quiz online at the NEP downloadable displays site http://www.ca.uky.edu/HES/index.php?p=386 or a printed copy of the displays is provided for use. Give students Refined or Not Refined handout (handout 2-2) and review the parts of a grain kernel.

**Activity 7**

Use activity sheet 2-2 Threshing with Feet. This activity is to give students the chance to experience threshing techniques. Threshing is a technique used to remove the stems & husks of grains or seeds. Read activity sheet to determine supplies needed for this activity. *(You will have to purchase cut wheat for this activity. Check with a local farmer, who may be able to provide some for your class).*
Activity 8

(Script)

Now that we know how to identify whole-grain foods, can anyone tell me why whole-grain foods are important for everyday consumption? (High fiber) What does fiber do for us? It works to keep our digestive tract running smoothly and helps get rid of waste from our body. It also helps lower blood cholesterol and control blood sugar.

Because you know why grains are needed, now we need to think about where grains come from and, to be specific, which ones are grown in Kentucky. What do you think Kentucky grain producers do with their grain products?

Here are some exercises to help students explore locally produced grains:

Poster project and presentation activity sheet 2-3. Have groups or individuals choose one grain type grown in Kentucky and research: product planting, germination process, harvesting (when and how), equipment used in the whole process (types, cost, and skill level to operate), storage, marketing, and distribution. Some appropriate websites are listed in activity 9. Along with researched information have students diagram and label their chosen grain. (Some examples have been provided for you: handout 2-2).

Additional topics:
- Seed prices, germination, soils, and yield.
- Equipment prices, rental, and uses.
- Processing (how & where in Kentucky).
- Marketing, sales, profit margin and prices, and where to sell.

Activity 9

Allow the students to research Kentucky-grown grains further by using the Internet or interviewing Kentucky farmers and report back to the class. Suggested resources include:

- Kentucky Small Grain Growers Association, http://www.kysmallgrains.org/resources/resources.html
- University of Kentucky Cooperative Extension Service Publications on Grain Crops, http://www.uky.edu/Ag/GrainCrops/publications.htm
- Kentucky Department of Agriculture, http://www.kyagr.com/

Activity 10

Are there places in Kentucky that produce commodities with Kentucky grains? Using a map of Kentucky, identify different places in the state that produce grain products. Alternatively, have students identify and map Kentucky mills that are still active. (Activity Sheet 2-4)

Examples of Kentucky Mills
- Connersville Mill Co.
- Wiesenberger Mills
- Hodson Mills
Additional Activities:

• Take a field trip to a farm where grain is grown. Ask the farmer to discuss the soil, climate, and water needs of his grain crop, pests, and diseases to be considered, how the grain is harvested, marketed and processed, and costs associated with each step (objective 5 and 6 contributing activity).

• Invite a grain producer to speak to your class. Ask the farmer to discuss the issues suggested above (objective 5 and 6 contributing activity).

• Have students create an intricate picture made out of different Kentucky grain seeds (objective 5 contributing activity).

• Garbage can lid activity (objective 4 contributing activity):

After the wheat has been cut, beat the stalks on a clean trash can lid to gather the grain. *(You will have to purchase cut wheat for this activity. Check with a local farmer, who may be able to provide some for your class).* If some chaff (protective casing around the grain seed) is left in the lid, toss it up in the air and the seed will fall back to the lid and the chaff will blow away. A fan on low speed might be necessary to provide enough wind to blow the chaff. For additional information use handout 2-3 Reap What You Sow?

References:


Additional Resource:

YouTube Old time Threshing Grain in a modern world using Antique John Deere Tractors http://www.youtube.com/watch?v=RVKKydAfYyU

Old Threshing Song http://sniff.numachi.com/pages/tiTHRSNSG;ttTHRSHSNG.html


<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Informational</strong></td>
</tr>
<tr>
<td>RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</td>
</tr>
<tr>
<td><strong>Reading Science &amp; other Technical</strong></td>
</tr>
<tr>
<td>RST.9-10.1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</td>
</tr>
<tr>
<td>RST.9-10.2. Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</td>
</tr>
<tr>
<td>RST.9-10.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</td>
</tr>
<tr>
<td>RST.9-10.7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.</td>
</tr>
<tr>
<td>RST.9-10.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
</tr>
<tr>
<td>W.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>W.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</td>
</tr>
<tr>
<td><strong>Writing Science &amp; other Technical</strong></td>
</tr>
<tr>
<td>WHST.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>WHST.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</td>
</tr>
<tr>
<td>WHST.9-10.9. Draw evidence from informational texts to support analysis, reflection, and research.</td>
</tr>
<tr>
<td><strong>Speaking &amp; Listening</strong></td>
</tr>
<tr>
<td>SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.</td>
</tr>
<tr>
<td>Kentucky Core Academic Standards</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td><strong>Reading Informational</strong></td>
</tr>
<tr>
<td>RI.11-12.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.</td>
</tr>
<tr>
<td>RI.11-12.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).</td>
</tr>
<tr>
<td>RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</td>
</tr>
<tr>
<td><strong>Reading Science &amp; other Technical</strong></td>
</tr>
<tr>
<td>RST.11-12.1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</td>
</tr>
<tr>
<td>RST.11-12.2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</td>
</tr>
<tr>
<td>RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</td>
</tr>
<tr>
<td>RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</td>
</tr>
<tr>
<td>RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</td>
</tr>
<tr>
<td>RST.11-12.8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</td>
</tr>
<tr>
<td>RST.11-12.9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
</tr>
<tr>
<td>W.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>W.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</td>
</tr>
</tbody>
</table>
| **Writing Science & other Technical** | WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
WHST.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.  
WHST.11-12.9. Draw evidence from informational texts to support analysis, reflection, and research. |
| **Speaking & Listening** | SL.11-12.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.  
SL.11-12.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks |
# A Grain of Great Proportion

<table>
<thead>
<tr>
<th>Your Favorite Grain Food</th>
<th>Your Serving Size (ounce equivalents)</th>
<th>MyPlate Serving Size (ounce equivalents)</th>
<th>What's The Difference?</th>
<th>A-B=C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTALS**

If column C is a positive you may be getting too much of your favorite grain foods. If column C is a negative number you may not be getting enough of your favorite grain foods.

How many grain servings (ounce equivalents) are you getting each day? ____________________________

How many grain servings (ounce equivalents) should you have each day? ____________________________

What can you do to get the correct amount of servings? Be specific __________________________________

____________________________________________________________________________________________

____________________________________________________________________________________________

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Grain for Grain

Grains provide a number of nutrients, such as:

• Carbohydrates for energy
• Protein for growth and repair
• Iron for healthy blood and muscles
• B vitamins for healthy skin, using energy from food, controlling appetite, keeping your digestive tract and nervous system working right, and preventing miscarriages and birth defects
• Fiber for helping us to feel full, preventing constipation, helping to regulate blood sugar and cholesterol, and preventing bowel disorders

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Refined or Not Refined

What is the difference between whole grain and refined grain?

• Whole grains contain all three components of the grain kernel: bran, endosperm, and germ.
  • Bran, the outer layer, provides most of the grain’s fiber.
  • Endosperm, the middle, provides protein and carbohydrates.
  • The germ, the inner part of the grain, provides trace minerals, B vitamins, antioxidants, saturated fats, and phytochemicals.

• Refined grains have been processed to remove the bran and the germ, which contain important nutrients and most of the fiber provided by the grain product. The vitamins and minerals are put back into the refined grain products, creating enriched grains. Fiber is not replaced in enriched grain products. Therefore, half of your daily grain intake should be made with whole-grain products.

If someone gave you a brown piece of bread, what would you assume about that bread?

• Most people would assume it was whole-grain bread. This may or may not be true depending on the ingredients and how they are listed.

Where can information be found if you want to be sure you are getting whole-grain foods?

• Look at the food label and find out which ingredient comes first. If the first ingredient is either refined flour or whole-wheat flour, which one would be the best source of whole grain?
What part of the grain is removed during refining?

What nutrients are contained in this part of the grain?

Sometimes the food industry adds B vitamins to grains that have had the bran and germ removed, and labels these foods "enriched." The industry does not replace the fiber lost in processing. Enriched grains are never whole grains.
Whole Grain Displays

The University of Kentucky Cooperative Extension Service Nutrition Education Program whole grain displays include three displays addressing bread, cereal, and rice and pasta. Each display discusses the importance of the USDA Dietary Guidelines recommendation to make half your grains whole in order to meet needs for fiber consumption. The goal of each display is to provide experience using labels to determine whether a product is a good source of whole grain. Each display features photographs, ingredient labels, and nutrition facts labels from four products that can be assembled in flip chart format. Grains Group handouts NEP 202 and NEP 202A and Label lesson handouts NEP 209, NEP 209A and NEP 209B from the Nutrition Education Program may be used to supplement the displays.

The Cereal display is shown below.

Prepared by: Jackie R. Walters, MBA, RD, LD
University of Kentucky
Extension Specialist for Nutrition Education Programs
August 2008

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Make Half Your Grains Whole

The average American consumes 7 to 14 grams of fiber daily.

How much do you need?

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 years</td>
<td>19 g</td>
<td>19 g</td>
</tr>
<tr>
<td>4-8 years</td>
<td>25 g</td>
<td>25 g</td>
</tr>
<tr>
<td>9-13 years</td>
<td>31 g</td>
<td>28 g</td>
</tr>
<tr>
<td>14-50 years</td>
<td>38 g</td>
<td>25 g</td>
</tr>
<tr>
<td>51+ years</td>
<td>31 g</td>
<td>21 g</td>
</tr>
<tr>
<td>Pregnancy</td>
<td></td>
<td>28 g</td>
</tr>
</tbody>
</table>

Increase Fiber In Your Diet

The 2010 USDA Dietary Guidelines for Americans recommend adults eat three 1 ounce equivalents per day of whole grain foods, preferably in place of refined grains.

In other words, at least half of our bread servings should be whole grain.
In order to be a good source of whole grain, the first item in the ingredient list must be *Whole Grain.*

**INGREDIENTS:** *STONE GROUND WHOLE WHEAT FLOUR,* WATER, HIGH FRUCTOSE CORN SYRUP, WHEAT GLUTEN, YEAST...

---

**What are some whole grains?**

**Whole Grains:**
- Whole Wheat
- Brown Rice
- Whole Oats
- Bulgur (Cracked Wheat)
- Popcorn
- Whole Rye
- Graham Flour
- Pearl Barley
- Whole Grain Corn

**NOT Whole Grains:**
- Wheat Flour
- Enriched Flour
- Wheat Farina
- Degerminated Corn Meal

---

**Are these breads good sources of whole grain?**
No

The first ingredient listed is *enriched* wheat flour. The label says it is *made with* whole grain, but the whole grain content is less than 50 percent.
No

The first ingredient listed is enriched flour.
Yes

The first ingredient listed is *whole wheat flour.*
Yes

The first ingredient listed is whole wheat flour. White whole wheat does have the same levels of fiber, vitamins, and minerals as red whole wheat. There may be differences in phytochemical content and cancer protection.*

Are these cereals good sources of whole grain?

INGREDIENTS:
WHEAT FARINA...
No

The first ingredient listed is wheat farina. Wheat farina is hard wheat from which the bran and most of the germ have been removed prior to grinding. One serving of this cereal provides just 1 gram of fiber.
Yes
The only ingredient listed is whole grain rolled oats. One serving of this cereal (1/2 cup dry) provides 4 grams of dietary fiber.

INGREDIENTS:
RICE, SUGAR, CORN MEAL, ALMOND PIECES, HONEY, SALT...
No

The first ingredient listed is rice. It is not whole grain (brown) rice. One serving of this cereal provides 0 grams of fiber.

The second ingredient listed is sugar.
Yes
The first ingredient listed is wheat bran, the most nutritious part of the grain. It is also the part of the grain that is highest in fiber. One serving of this cereal provides 7 grams of fiber.

Are the following products good sources of whole grain?
No

The first ingredient listed is enriched rice, rather than brown (whole grain) rice. This rice provides less than 1 gram of fiber.
POWERPOINTS

LESSON 2

KENTUCKY FARM 2 SCHOOL

INGREDIENTS:
Precooked parboiled brown rice

Yes
The only contents are brown rice, a whole grain. One cup of prepared brown rice provides 2 grams of fiber, while the same amount of white rice provides less than 1 gram of fiber.
Yes

The only ingredient listed is whole wheat flour.

One serving of this pasta provides 6 grams of dietary fiber.
Yes

Whole wheat flour is the first ingredient listed. This pasta contains a blend of flour. It provides less fiber than whole wheat pasta, but it contains enough whole grain to be a good source.
Threshing With Feet?

Threshing is a technique used to remove the stems and husks of grains or seeds. Threshing can be accomplished by stomping or “dancing” on top of the seed heads, rubbing by hand, or by using a variety of machines. For small seed lots it is often more efficient to thresh by hand than to thresh with mechanical threshers. Mechanical threshers increase efficiency of processing lots over about 50 to 100 pounds but usually require a large enough quantity to operate properly and can require substantial work to clean out the machine after use.

To thresh by hand:

- Lay the seed bundles on a tarp or in a large bucket.
- Wiggle your feet from side to side on top of the seeds, allowing the ball of your foot to slide in place left to right, as if you were squishing a bug.
- Make sure to have several inches of seeds and chaff between your foot and the bottom of the bucket or the ground while crushing.
- Crushing seeds directly on a hard surface, or for too long, can damage the seeds. Each crop varies in sensitivity to pressure so it is important to check the seeds to see if they have received sufficient pressure to break free from the plant material or if they are cracking from too much pressure.

More delicate seeds can also be threshed by rubbing between your hands with a pair of gloves or rubbing the seed and plant material over a rough surface by hand. The seed can be rubbed against sandpaper to remove the bran and the germ. (Colley, Stone & Brewer, 2010)
Kentucky Grain Presentation and Poster Project

Choose one grain type grown in Kentucky and provide the following information:

- product planting
- germination process
- harvesting (when and how)
- equipment used in the whole process (types, cost, and skill level to operate)
- storage
- processing (how and where in Kentucky)
- marketing
- distribution
- diagram and label your chosen grain

Additional topic

- seed prices, germination, soils, and yield
- equipment prices, rental, and uses
- sales, profit margin and prices, and where to sell

Additional Resources:

Comprehensive Guide to Wheat Management in Kentucky, [http://www.ca.uky.edu/agc/pubs/id/id125/id125.htm](http://www.ca.uky.edu/agc/pubs/id/id125/id125.htm)

Kentucky Small Grain Growers Association, [http://www.kysmallgrains.org/resources/resources.html](http://www.kysmallgrains.org/resources/resources.html)

University of Kentucky Cooperative Extension Service Publications on Grain Crops, [http://www.uky.edu/Ag/GrainCrops/publications.htm](http://www.uky.edu/Ag/GrainCrops/publications.htm)


Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Reap What You Sow?

Reaping

Early reaping was all done by hand. Reaping is the cutting of the grain. In Europe, the scythe had been introduced by the Romans. Yet the Europeans continued to use the sickle until limited labor forced them to use the more efficient scythe. By hand, a worker could cut about three-tenths of an acre in a day. An experiment with an old sickle harvested 6.25 pounds in one hour, yielding two pounds after being threshed. After being cut, the stalks were tied into bundles and allowed to dry. After drying, the wheat would be threshed and winnowed.

Threshing and Winnowing

Threshing is separating the grain from the stalks. In early days, this was accomplished by men hitting it with a flail (an agricultural tool used to separate grains from the husk). In some countries the grain was spread on the floor and threshed by animals pulling heavy sleds over the grains.

After the wheat was threshed, it would be tossed into the air to separate it from the chaff. This process was known as winnowing.

The entire process could take up to two months.

(History Source LLC., 2011)
Kentucky Counties

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.

Jalinda Fead, 8th grade, Woodford County Middle School
Facilitator Guide
Lesson 3: Farm Fresh Veggies

Lesson Outcomes:

1. Identify MyPlate vegetable group and which foods fit into this group.
   Contributing activities
   • Lesson introduction Q & A
   • Activity 1

2. Identify the number of Recommended Daily Allowance (RDA) and appropriate serving sizes from each vegetable subcategory (dark green, orange, etc.).
   Contributing activities
   • Lesson introduction Q & A
   • Activity 1
   • Handout 3-1
   • Activity 7

3. List the roles of vegetables in the diet and the different nutrients associated with each vegetable subcategory.
   Contributing activities
   • Activity 1
   • Activity 4
   • Activity sheet 3-1

4. Identify vegetable parts (root, stem, leaf) and explain the functions of each.
   Contributing activities
   • Activity 2
   • Handout 3-2

5. Identify Kentucky-grown veggies and when they are in season and/or harvested.
   Contributing activities

6. Identify some Kentucky vegetable producers, their locations, and how they distribute their products.
   Contributing activities
   • Activity 4
   • Activity sheet 3-1

Materials and Equipment:

• Projector for PowerPoint® presentation
• Vegetable Parts PowerPoint® presentation
• Index cards (optional)
• Flip chart sticky paper or (vegetable subcategory labels)
• Tape
• Handout 3-1 Vegetable Subcategories Chart
• Handout 3-2 Vegetable Parts Chart
• Handout 3-3 World Map
• Kentucky Proud Produce information sheet http://www.kyagr.com/kyproud/docs/AvailGuide.pdf
Lesson Initiation

Bell ringer/class opener:

Write on the board or ask students to list how many servings of vegetables they ate yesterday and whether they consumed their recommended daily amount.

Lesson Introduction

(Script)

Last time we talked about the grain group of MyPlate. What foods belong in the grain group? Did anyone try a new grain food?

Q: How many groups are included in MyPlate?

A: Five. Out of those five groups, we are going to talk about the vegetable group today.

Q: What are the different foods that go into the vegetable group of MyPlate?

A: Beans, corn, peas, lettuce, tomatoes, potatoes, squash, etc.

Q: How many servings of vegetables should the average person have in a day?

A: 2 ½ cups per day.

Q: Are all vegetables measured the same way? Would you count 1 cup of raw leafy greens the same as 1 cup of cooked vegetables?

A: It takes 2 cups of raw leafy greens to equal a 1 cup vegetable serving.

There are subcategories of vegetables and different parts of vegetables that we eat based on nutrients. The subcategories are dark green, orange, dry beans and peas, starchy, and other.

Use handout 3-1 to review subcategories of vegetables and which vegetables belong in each subcategory.

Activity 1

Use flip chart sticky paper or make labels that can be placed around the room. Each paper or label should be titled with a different subcategory of vegetables: dark green, orange, dry beans/peas, starchy, and other. Assign each student an index card bearing the name of a different vegetable. You may want to have the students draw a card from a hat.

<table>
<thead>
<tr>
<th>Eggplant</th>
<th>Kohlrabi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrots</td>
<td>Peppers</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>Cucumbers</td>
</tr>
<tr>
<td>Okra</td>
<td>Onions</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>Potatoes</td>
</tr>
<tr>
<td>Squash</td>
<td>Sweet potatoes</td>
</tr>
<tr>
<td>Beets</td>
<td>Radishes</td>
</tr>
<tr>
<td>Asparagus</td>
<td>Cabbage</td>
</tr>
<tr>
<td>Beans</td>
<td>Broccoli</td>
</tr>
<tr>
<td>Leafy greens</td>
<td>Lettuce</td>
</tr>
<tr>
<td>Peas</td>
<td>Zucchini</td>
</tr>
<tr>
<td>Corn</td>
<td>Pumpkins</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>Turnips</td>
</tr>
<tr>
<td>Red peppers</td>
<td>Sorghum</td>
</tr>
</tbody>
</table>
Each student should research the nutrients their vegetable provides (Use handout 3-1 or the Internet) and determine the appropriate serving size for his or her specific vegetable. Then the students should write the information on the index card along with a picture or drawing of the vegetable. Once they have completed the information, have them put the vegetable index card under the right subcategory placed around the room. Have a group discussion to check the correctness of each vegetable listed under each subcategory.

Activity 2

(Script)

*The different parts of vegetables we eat are leaf, stem, seeds, flowers, fruit, and root/bulb.*

Use handout 3-2 to review vegetable parts.

Use the vegetable parts quiz PowerPoint® to identify parts. At the end of the PowerPoint® presentation, review the vegetable parts quiz with the students. A printed copy of the PowerPoint® slides has been provided; the following chart provides the answers.

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kale</td>
<td>Leaf</td>
</tr>
<tr>
<td>Broccoli</td>
<td>Flower</td>
</tr>
<tr>
<td>Onions</td>
<td>Root</td>
</tr>
</tbody>
</table>

Additional Activity:

Have students identify which part of the plant was the origin of the vegetables assigned in activity 1.

Activity 3

(Script)

Q: Now we know different subcategories and parts of vegetables. What types of vegetables do Kentucky farmers grow?

A: Most vegetables can be grown and harvested in Kentucky, and a few are large crops produced for bulk sale.

Q: What is the most produced vegetable crop in Kentucky?

A: Corn.

Ask students to name different products that are made by or made with corn. (Taco shells, corn meal, ethanol, and oil. See handout 1-1 from lesson 1, Agricultural Content of Common Household Consumer Products.) Have students brainstorm other vegetables grown in Kentucky (see Kentucky Proud Produce Availability chart) and write their answers on the board/white board.

Most people think of vegetables as being in season, or harvested, in the fall of the year but different vegetables have different “in season” or harvesting times. Have the students name several types of vegetable and discuss the time...
of the year the vegetables are in season (see Kentucky Proud Produce Availability chart). Ask the students if they know why it is important to consume vegetables when they are in season (taste, cost, availability, and nutrient density).

Activity 4
Kentucky Favorites activity sheet 3-1. Have each student pick his or her favorite four vegetables. Using the Kentucky Proud Produce Availability chart, have students create their own availability and nutrition chart. Have the student include Kentucky producers, the producers’ location, crop harvesting time and procedure, and, if possible, how the produce is distributed. The chart should include each of their chosen vegetables, the months of the year the vegetables are in season, the nutrients they contain, and Kentucky producer information. Emphasize to the students they should eat a variety of vegetables not just their favorites. This chart should be presented to the school system’s food service director. This might help them locate local foods for use in the school meal program.

Activity 5
Individual or group activity.

Have students’ select one vegetable, maybe their favorite vegetable, and provide three to five different recipes demonstrating ways to cook and present the chosen vegetable. If possible, have each student pick one recipe and prepare it for the class. Invite the school food service director for a sampling of the recipes and provide him or her with a copy of the recipe for use in the school meal program.

Activity 6
Individual or group activity.

Have students’ read the scenario Surviving Kentucky in the 1700s (activity sheet 3-1) and develop a menu for one week for a family living in Kentucky during this time period. The menu should reflect the student’s MyPlate eating plan.

Activity 7
(This activity is continued through each lesson) Art Activity – Have students create their own portion size kits to help them estimate appropriate servings of vegetables, following directions in activity sheet 1-3 of the introductory unit. Parts of the kit relevant to the vegetable group include ½ cup for cooked vegetables, 1 cup for leafy green vegetables, and ¼ cup for cooked dry beans or peas (equivalent to 1 ounce of meat.) This activity is offered for each lesson so the entire portion size kit is created by the end of the curriculum.

Additional Activities
• List vegetables that are sold in area grocery stores, convenient stores, and other retail outlets. Give the origin of the vegetables. Estimate how far the vegetables are shipped; whether they are ripe when picked, etc. (contributing activity for objective 5 and 6).

• Go to a grocery and make a list of veggies available for sale. Note where they came from and then map it on a World map. (Geography) (contributing activity for objective 5 and 6)

• Visit a farmers market to find out which veggies are sold by local farmers. This can also be researched on http://ky.marketmaker.uiuc.edu/ (contributing activity for objective 5 and 6).
• Develop a video to promote a favorite Kentucky veggie and post on YouTube or school website. *(contributing activity for objective 5).*

• Choose a vegetable and research its root, stem, and leaf system. Develop a poster or brochure to present to the group or class. Develop or find a recipe to present or try (if facility supports the activity) *(contributing activity for objective 4).*

• Pick a Kentucky-grown vegetable and make up a poem, short story, rap, or rhyme for children encouraging them to taste it. It should contain pictures and/or graphics *(contributing activity for objective 5).*
### Kentucky Farmers School

**Grades 9-10: Lesson 3**  
**Farm Fresh Veggies**

<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Informational</strong></td>
</tr>
<tr>
<td>RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</td>
</tr>
<tr>
<td><strong>Reading Science &amp; other Technical</strong></td>
</tr>
</tbody>
</table>
| RST.9-10.1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.  
RST.9-10.2. Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.  
RST.9-10.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.  
RST.9-10.7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.  
RST.9-10.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. |
| **Writing**                      |
| W.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
W.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **Writing Science & other Technical** |
| WHST.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
WHST.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.  
WHST.9-10.9. Draw evidence from informational texts to support analysis, reflection, and research. |
| **Speaking & Listening**         |
| SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
## Kentucky Core Academic Standards

### Reading Informational
- **RI.11-12.1.** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
- **RI.11-12.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
- **RI.11-12.7.** Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

### Reading Science & other Technical
- **RST.11-12.1.** Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- **RST.11-12.2.** Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- **RST.11-12.3.** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
- **RST.11-12.7.** Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- **RST.11-12.8.** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- **RST.11-12.9.** Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

### Writing
- **W.11-12.7.** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- **W.11-12.8.** Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
### Writing Science & other Technical

| WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. |
| WHST.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| WHST.11-12.9. Draw evidence from informational texts to support analysis, reflection, and research. |

### Speaking & Listening

| SL.11-12.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. |
| SL.11-12.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
### Vegetables Subcategory Chart

<table>
<thead>
<tr>
<th>Type of Vegetable</th>
<th>Nutrients Found in Vegetable Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark green vegetables</td>
<td>Vitamin A, Vitamin C, B Vitamins, Iron, Calcium</td>
</tr>
<tr>
<td>(broccoli, collard greens, spinach)</td>
<td></td>
</tr>
<tr>
<td>Orange vegetables</td>
<td>Vitamin A</td>
</tr>
<tr>
<td>carrots, sweet potatoes, winter squash</td>
<td></td>
</tr>
<tr>
<td>Dried Beans, Peas, &amp; Legumes</td>
<td>Protein, Folate, Potassium, Iron and Magnesium</td>
</tr>
<tr>
<td>(beans, peas, lentils, soybeans, peanuts)</td>
<td></td>
</tr>
<tr>
<td>Starchy vegetables</td>
<td>B Vitamins</td>
</tr>
<tr>
<td>(potatoes, corn, lima beans)</td>
<td></td>
</tr>
</tbody>
</table>
# Vegetable Parts

<table>
<thead>
<tr>
<th>Part</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf</td>
<td>lettuce, cabbage, spinach, mustard greens</td>
</tr>
<tr>
<td>Stem</td>
<td>asparagus, celery</td>
</tr>
<tr>
<td>Root</td>
<td>radish, beet, carrot, potato</td>
</tr>
<tr>
<td>Seeds</td>
<td>peas, corn</td>
</tr>
<tr>
<td>Flowers</td>
<td>cauliflower, broccoli</td>
</tr>
<tr>
<td>Fruit</td>
<td>squash, tomatoes, cucumber, eggplant, peppers</td>
</tr>
</tbody>
</table>
Vegetable Parts

Parts? What Kind of Parts?

Leaf
Stem
Root
Seeds
Flowers
Fruit

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flowers
Fruit

Corn
Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

Celery

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

Cabbage

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

Potatoes
Name the Vegetable Part

<table>
<thead>
<tr>
<th>Leaf</th>
<th>Stem</th>
<th>Root</th>
<th>Seeds</th>
<th>Flower</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Asparagus

<table>
<thead>
<tr>
<th>Leaf</th>
<th>Stem</th>
<th>Root</th>
<th>Seeds</th>
<th>Flower</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carrots

<table>
<thead>
<tr>
<th>Leaf</th>
<th>Stem</th>
<th>Root</th>
<th>Seeds</th>
<th>Flower</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Spinach

<table>
<thead>
<tr>
<th>Leaf</th>
<th>Stem</th>
<th>Root</th>
<th>Seeds</th>
<th>Flower</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable</td>
<td>Leaf</td>
<td>Stem</td>
<td>Root</td>
<td>Seeds</td>
<td>Flower</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>Broccoli</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GREAT JOB!
Kentucky Favorites

Choose four of your favorite Kentucky vegetables. Using the Kentucky Proud Produce Availability Chart, create your own availability and nutrition chart. Include Kentucky producers, the producers’ location, and, if possible, how the produce is distributed. Optional activity: Compare the nutrient content of the four vegetables. What nutrients would be missing if those were the only vegetables eaten? What vegetables would be added to a diet to make sure all necessary nutrients were received? The chart should include:

• Each of your chosen vegetables.
• Pictures or drawings of your chosen vegetables.
• The months of the year they are in season.
• The nutrients they contain.
• Kentucky producers’ information.
Enjoy the freshness, flavor and excellence of Kentucky Proud Produce

It really makes a difference when you purchase locally grown fruits and vegetables. You provide your family with garden fresh taste and quality, while also helping the community by keeping your food dollars close to home.

<table>
<thead>
<tr>
<th>Colorful Eating</th>
<th>Color-code your shopping and be on your way to better health. Each color group of produce offers different phytochemicals, antioxidants and nutrients that help you stay healthy in a variety of ways.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Get the blues (and purples)</strong></td>
<td>Brain/memory, healthy aging, urinary tract</td>
</tr>
<tr>
<td><strong>Fruits</strong></td>
<td>Blackberries, Blueberries, Grapes, Plums</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td>Eggplant, Kohlrabi, Purple asparagus, Purple cabbage, Purple carrots, Purple peppers</td>
</tr>
<tr>
<td><strong>Great greens</strong></td>
<td>Vision, bones, teeth</td>
</tr>
<tr>
<td><strong>Wonderful whites</strong></td>
<td>Heart, maintain healthy cholesterol</td>
</tr>
<tr>
<td><strong>Outstanding oranges (and yellows)</strong></td>
<td>Vision, immune system, heart</td>
</tr>
<tr>
<td><strong>Radiant reds</strong></td>
<td>Heart, urinary tract, brain/memory</td>
</tr>
<tr>
<td><strong>Fruits</strong></td>
<td>Pears (brown), White peaches</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td>Cauliflower, Kohlrabi, Onions, Potatoes, White corn</td>
</tr>
<tr>
<td><strong>Fruits</strong></td>
<td>Cantaloupe, Peaches, Yellow apples, Yellow pears, Yellow watermelon</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td>Carrots, Corn, Golden potatoes, Peppers, Pumpkins, Squash, Sweet potatoes, Yellow tomatoes</td>
</tr>
<tr>
<td><strong>Fruits</strong></td>
<td>Apples, Grapes, Pears, Raspberries, Strawberries, Watermelons</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td>Beers, Radishes, Red peppers, Sorghum, Tomatoes, Turnips</td>
</tr>
</tbody>
</table>

Source: Kentucky Proud
Buying Kentucky Proud is easy. Look for the label at your grocery store, farmers’ market, or roadside stand. Our secret ingredient is the hard work and dedication of Kentucky’s farm families. Find out why “Nothing else is close.”

<table>
<thead>
<tr>
<th>Produce</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEPT</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asparagus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackberries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blueberries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broccoli</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brussel Sprouts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabbage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cantaloupe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrots</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cauliflower</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn (Sweet)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cucumbers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggplant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grapes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greens*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kohlrabi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lettuce</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Okra</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions (white)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions (green)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paw Paws</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peppers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plums</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potatoes**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pumpkins</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radishes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raspberries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sorghum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squash (summer)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squash (winter)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet Potatoes**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turnips</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watermelons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Surviving Kentucky in the 1700’s

Read the following passage. Then design a one-week menu, with locally grown vegetables, for a family living in Kentucky during the 1700s to 1800s. The menu should reflect USDA’s Dietary Guidelines for Americans. Remember, individuals of this time period did not have the luxury of having food transported from across the country or the world. This will require further research, so some additional resources are listed at the end of the passage.

During the 18th and 19th centuries, Americans had a very different diet than we have today. The meal structures were different; families did not have the type of breakfast, lunch, and dinner we eat. Settlers also ate foods depending on where they lived and the kind of crops that could be grown. Present-day consumers are given many different choices. Food is transported from all over the globe, allowing us to experience new flavors and cooking techniques. In the 1700s and 1800s, people living in New England ate differently than people living on Southern plantations. Settlements were populated by immigrants with different nationalities, providing cultural influences on the way foods were prepared and eaten. The Spaniards settled in St. Augustine, Florida, the English in Jamestown, Pennsylvania, and southern colonies, and the Dutch in New York. Individuals brought with them family recipes and cooking styles that had to be adapted to the available ingredients. Native Americans introduced new ingredients such as corn, squash, and wild rice.

Meal times and structures were different and sometimes depended on financial and social status. Poorer settlers ate breakfast early and the wealthy ate later in the morning. Settlers took care of morning chores and job assignments and then ate breakfast. Our normal breakfast might consist of box cereal with milk, or bacon/sausage, eggs, biscuits, pancakes, and juice. Settlers drank beer or cider and ate a quick bowl of porridge, a dish made with grain (usually oats) and milk or water. Porridge can also be made with rice, wheat, barley, or corn. Cornmeal mush was eaten with molasses. It wasn’t until the 19th century that coffee, tea, muffins, and toasts became a regular staple of breakfast. “The size of breakfast grew in direct proportion to growth of wealth.” (Oliver, 2000)

There was no meal called lunch. Dinner was the mid-day meal. For most people in the 18th century it was the biggest meal of the day. Dinner was usually served in the early afternoon to mid-day. It consisted of stews, breads, and available fruits and vegetables. Most stews included some kind of meat, corn, cabbage, and other vegetables. The wealthier served two courses during dinner. The first course was made up of meat, meat pies, and meat puddings, pancakes and/or fritters, and some side dishes. The second course consisted of desserts and sometimes salads.

Supper was the evening meal. It was usually a light repast (a bedtime snack) and may not have even been served in some homes. Supper was made up of leftovers from the afternoon meal. Supper became more important during the 19th century, when dinner began being served earlier in the day.
Additional resource:

“The Good Land-Native American and Early Colonial Food” by Patricia B. Mitchell

From the above passage, it is evident that settlers did not have the variety of foods available today. When developing your menu, be creative because the same vegetable may need to be served more than once during the week. Reflect different cooking techniques and provide descriptions of the colonial cooking techniques.

Reference:

World Map
LESSON 4

FRUITS

“Let’s grow Healthy the
Kentucky Proud Way!”

Megan Taylor, 6th grade, Rockcastle County Middle School

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Facilitator Guide

Lesson 4: Fruits from the Farm

Lesson Outcomes:

1. Define fruit.
   Contributing activities
   • Introduction
   • Handout 4-1

2. Identify MyPlate fruit group and which foods fit into this group.
   Contributing activities
   • Introduction
   • Handout 4-1

3. Identify the number of Recommended Daily Allowance (RDA) and serving sizes of fruit.
   Contributing activities
   • Introduction
   • Handout 4-1
   • Activity 9

4. Know the nutritional role of fruit in the diet and identify sources of fiber in fruit.
   Contributing activities
   • Activity 2
   • Activity sheet 4-1
   • Handout 4-2
   • Activity 3
   • Activity sheet 4-2
   • Activity 4
   • Activity sheet 4-3

5. Identify Kentucky-grown fruits and when they are in season and/or harvested.
   Contributing activities
   • Activity 3

6. Identify Kentucky fruit producers, their locations, and how they distribute their products.
   Contributing activities
   • Activity 7

Materials and Equipment:

• MyPlate Worksheet NEP-201C or USDA (completed in lesson 1)
• Kentucky Proud Produce Information Sheet http://www.kyagr.com/kyproud/docs/AvailGuide.pdf
• Handout 4-1 Fruity Q & A
• Activity sheet 4-1 Is Fresh Better?
• Handout 4-2 Nutrition Composition
• Activity sheet 4-2 Fruit Nutrients and Producer
• Activity sheet 4-3 Fruit Variety Comparison
Lesson Initiation

Bell ringer/class opener:

Write on the board or ask students, “How do you define fruit?”

Lesson Introduction

Review last lesson

(last script)

Last time we talked about the vegetable group of MyPlate. What foods belong in the vegetable group? Did anyone try a new vegetable?

How many groups are included in MyPlate? Out of those five groups we are going to talk about the fruit group today. Sometimes identifying fruits can be confusing.

Have students share their definition of fruit.

Activity 1

Use handout 4-1, Fruity Q & A.

Review handout 4-1 and have a class discussion.

Activity 2

Use activity sheet 4-1 and handout 4-2 for this activity.

Have students identify and compare the nutrient composition of fresh, frozen, canned, and dried fruits and fruit juices. Students should select types of fruit familiar to consumers in the area, and use the USDA Home and Garden Bulletin Number 72, Nutritive Value of Foods, (http://www.nal.usda.gov/fnic/foodcomp/Data/HG72/hg72_2002.pdf) to evaluate the amount of vitamin C, vitamin A and fiber in each type. Values may differ slightly according to the selection from the website made by the student, as several forms are generally offered for each food. (For example, there may be values for unsweetened and uncooked dried apricots, sweetened and uncooked dried apricots, unsweetened and cooked dried apricots, and sweetened and cooked dried apricots.) Values will not be available for all forms of all foods. (For instance, dried watermelon is not commonly available.) The goal of the exercise is to provide students with a general understanding of how processing affects the nutrient content of fruit.

Additional Activity

After values have been found have students average the values for each form of fruit (fresh, frozen, canned, dried and juice) and plot the averages.

Activity 3

Use activity sheet 4-2.

Have each student pick their favorite 4 Kentucky grown fruits. Using the Kentucky Proud Produce Availability Chart, have students create their
own availability, nutrition, and producer chart. It should include each of their chosen fruits with the months of the year they are in season, a list of which nutrients the fruit contains, and the location of Kentucky producers.

Activity 4

Use activity sheet 4-3.

There are different varieties of fruits. Apples come in many different varieties, which can change the flavor, texture, color, and size of the fruit. Different varieties are used for different products. A Granny Smith apple could be used to make apple pie because of its tartness and because it holds its shape during cooking. Many people like a sweeter apple to eat out of their hand, like a red delicious. Grapes are also grown in many different varieties. Some varieties are used to make juice, some to make wine, and some for table consumption.

To explore the difference in fruit varieties, have students choose different fruits and varieties, then have the students complete the fruit varieties worksheet. (This is a taste testing activity so you will need different varieties of fruits. You could ask farmers to bring samples of different varieties and also speak to your class about the different uses for each variety.) Do not limit students to grapes and apples; all fruits have different varieties.

Activity 5

Use handout 4-3, KSU Extension handout Forest Production of Pawpaw, and UK Extension handout American Persimmon.

Two fruits that are indigenous to Kentucky include the pawpaw and the American persimmon. Have the students do additional research on one or both of the fruits and present the information to the class. Additional websites are listed below. If the fruit is available, allow students to taste test.

Additional Resources

American Persimmons [http://www.uky.edu/Ag/CDBREC/introsheets/persimmon.pdf]


Cooking with Pawpaw [http://www.hort.purdue.edu/newcrop/ksu-pawpaw/cooking.html]

Kentucky State University’s Pawpaw Program [http://www.pawpaw.kysu.edu/]

The Kentucky Pawpaw Regional Variety Trial [http://www.clemson.edu/hort/peach/pdfs/JAPS6225869.pdf]


Native Fruits of the Midwest [http://www.pawpaw.kysu.edu/PDF/PomperAPSfin2.pdf]

Activity 6

Contact the school system’s food service director prior to this activity to get permission for student involvement, or have the food service director come to the classroom to discuss fruit purchases and preparations for the school’s cafeteria. If the food service director cannot come to the class, have students contact the food service director to find out where their fruits come from. Using world map have the students map the fruit’s travel and calculate miles traveled. Have them determine if the fruit is picked early and treated any special way or if the fruit is picked or harvested ripe and brought directly to the lunch line.

Once the students have identified, located, and mapped the current fruit used in the school cafeteria, have them identify sources of Kentucky fruits. Have them identify the Kentucky farmers, processors, and distributors. Have them gather contact information to present to the school food service director. This can also be information presented to fellow students by designing posters or brochures.

Activity 7

Use handout 4-6.

Have students make their own fruit rollups at home using a Kentucky-grown fruit. Use the Fruit Rollups from Home recipe to prepare and have students bring samples for tasting (This recipe will work without a dehydrator).
Activity 8

Have students choose one Kentucky fruit, develop a recipe using the fruit, and provide copies for fellow students. A class cookbook could be assembled. Students may bring samples of their recipes for tasting. This could also be shared with the school food service director.

Activity 8

Use Kentucky Strawberry Freezer Jam recipe.

Make strawberry freezer jam with Kentucky fresh strawberries.

Activity 9

(This activity is continued through each lesson) Art Activity – Have students create their own portion size kits to help them estimate their servings of fruits, following directions in activity sheet 1-3 of the introductory unit. Parts of the kit relevant to the fruit group include ½ cup for dried fruit and 1 cup for fresh fruit. (This activity is offered for each lesson so the entire portion size kit is created by the end of the curriculum)

References:


# Kentucky Farm 2 School
## Grades 9-10: Lesson 4
### Fruit From the Farm

<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Informational</strong></td>
</tr>
<tr>
<td>RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</td>
</tr>
<tr>
<td><strong>Reading Science &amp; other Technical</strong></td>
</tr>
</tbody>
</table>
| RST.9-10.1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.  
RST.9-10.2. Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.  
RST.9-10.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.  
RST.9-10.7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.  
RST.9-10.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. |
| **Writing**                      |
| W.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
W.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **Writing Science & other Technical** |
| WHST.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
WHST.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.  
WHST.9-10.9. Draw evidence from informational texts to support analysis, reflection, and research. |
| **Speaking & Listening**         |
| SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
# Kentucky Core Academic Standards

## Reading Informational

- **RI.11-12.1.** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
- **RI.11-12.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
- **RI.11-12.7.** Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

## Reading Science & other Technical

- **RST.11-12.1.** Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- **RST.11-12.2.** Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- **RST.11-12.3.** Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
- **RST.11-12.4.** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- **RST.11-12.7.** Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- **RST.11-12.8.** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- **RST.11-12.9.** Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

## Writing

- **W.11-12.7.** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- **W.11-12.8.** Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
| Writing Science & other Technical | WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
WHST.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.  
WHST.11-12.9. Draw evidence from informational texts to support analysis, reflection, and research. |
|---|---|
| Speaking & Listening | SL.11-12.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.  
SL.11-12.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. |
Fruits are by definition: the structure of a plant that contains its seeds. A tomato, cucumber, and squash are just a few foods that can be classified as a fruit.

In our culture, however, we classify tomato, cucumber, squash and some other fruits as vegetables.

1. How do we know what is a fruit and what is a vegetable?

2. How many servings of fruits should the average person have in a day?

3. Are all fruits measured the same way?

4. Would you count 1 cup of fresh fruit the same as 1 cup of dried fruit? Why?

5. What about fruit juice?

A lot of people may not even consider the fact that fruits are seasonal or have a harvesting time since they are always available at the grocery store. Fruits are just like vegetables in the sense that they are seasonal and/or have a harvesting time.

6. Name two different types of fruits and discuss the time of the year the fruits are in season.

7. Why is it important to consume fruits when they are in season?

8. How many miles, on average, are fruits shipped to get to local grocery stores?

9. If fruits have to be shipped to our markets, what happens to them?
Fruits are by definition: the structure of a plant that contains its seeds. A tomato, cucumber, and squash are just a few foods that can be classified as a fruit.

In our culture, however, we classify tomato, cucumber, squash and some other fruits as vegetables.

1. How do we know what is a fruit and what is a vegetable?  
   A: For menu-planning purposes, fruits generally taste sweeter than vegetables and have higher sugar content.

2. How many servings of fruits should the average person have in a day?  
   A: 2 cups per day is recommended for a 2,000 calorie diet.

3. Are all fruits measured the same way?  
   A: No

4. Would you count 1 cup of fresh fruit the same as 1 cup of dried fruit?  
   A: No. In actuality 1 cup of dried fruit would equal a 2 cup serving of fruit.  
   Why?  
   A: The water has been taken out of dried fruit, so it is concentrated.

5. What about fruit juice?  
   A: 1 cup of juice is equal to 1 cup of fresh or canned fruit.

A lot of people may not even consider the fact that fruits are seasonal or have a harvesting time since they are always available at the grocery store. Fruits are just like vegetables in the sense that they are seasonal and/or have a harvesting time.

Discussion

6. Name two different types of fruits and discuss the time of the year the fruits are in season. (See Kentucky Proud Produce Availability chart.)

7. Why is it important to consume fruits when they are in season?  
   A: Taste, cost, availability, and nutrient density

8. How many miles, on average, are fruits shipped to get to local grocery stores?  
   A: 1,500 miles.

9. If fruits have to be shipped to our markets what happens to them?  
   A: Some fruits are picked before they are ripe so they will not get damaged during transportation. If this happens, the fruit does not have time to get all the best nutrients from the whole plant or develop full flavor while ripening, so we, as consumers, miss out on getting the best.

   • Green fruit doesn’t have a chance to sun-ripen; it’s artificially ripened with ethylene, a natural plant hormone.
   • Produce deprived of sunlight doesn’t have a chance to develop sunlight-related nutrients such as anthocyanins—the flavonoids that make cherries red and grapes purple. Anthocyanins are plant sunscreens. When humans ingest them, they provide protection against DNA damage, brain cell deterioration, cancer, and more. (Mitchell, 2005)
## Is Fresh Better?

<table>
<thead>
<tr>
<th>Type of fruit</th>
<th>Content of 1 cup fresh</th>
<th>Content of 1 cup frozen</th>
<th>Content of 1 cup Canned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vit C</td>
<td>Vit A</td>
<td>Fiber</td>
</tr>
<tr>
<td>Apples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blueberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of fruit</td>
<td>Content of 1/2 cup Dried</td>
<td>Content of 1 cup Juice</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vitamin C</td>
<td>Vitamin A</td>
<td>Fiber</td>
</tr>
<tr>
<td>Apples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blueberries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Vitamin C Content

- Fresh: 4 mg
- Frozen: 4 mg
- Canned: 5 mg
- Dried: 5 mg
- Juice: 0.5 mg

Content of Vitamin A

- Fresh: 4 IU
- Frozen: 4 IU
- Canned: 5 IU
- Dried: 5 IU
- Juice: 0.5 IU
Fiber Content

Food type

- Fresh
- Frozen
- Canned
- Dried
- Juice

Amount in g

- 0
- 1
- 2
- 3
- 4
- 5
- 6
# Is Fresh Better! Teacher Key

<table>
<thead>
<tr>
<th>Type of Fruit</th>
<th>Content of 1 cup fresh</th>
<th>Content of 1 cup frozen</th>
<th>Content of 1 cup canned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vit C</td>
<td>Vit A</td>
<td>Fiber</td>
</tr>
<tr>
<td>Apples</td>
<td>5 mg</td>
<td>59 IU</td>
<td>2.6 g</td>
</tr>
<tr>
<td>Blackberries</td>
<td>30.2 mg</td>
<td>308 IU</td>
<td>7.6 g</td>
</tr>
<tr>
<td>Pears</td>
<td>5.9 mg</td>
<td>32 IU</td>
<td>4.3 g</td>
</tr>
<tr>
<td>Strawberries</td>
<td>89.4 mg</td>
<td>18 IU</td>
<td>3 g</td>
</tr>
<tr>
<td>Peaches</td>
<td>10.2 mg</td>
<td>502 IU</td>
<td>2.3 g</td>
</tr>
<tr>
<td>Blueberries</td>
<td>14.4 mg</td>
<td>80 IU</td>
<td>3.6 g</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td><strong>25.85 mg</strong></td>
<td><strong>166.5 IU</strong></td>
<td><strong>3.9 g</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Fruit</th>
<th>Content of ½ cup dried</th>
<th>Content of 1 cup juice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vit C</td>
<td>Vit A</td>
</tr>
<tr>
<td>Apples</td>
<td>1.3 mg</td>
<td>22 IU</td>
</tr>
<tr>
<td>Blackberries</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Pears</td>
<td>5.1 mg</td>
<td>54 IU</td>
</tr>
<tr>
<td>Strawberries</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Peaches</td>
<td>4.8 mg</td>
<td>254 IU</td>
</tr>
<tr>
<td>Blueberries</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td><strong>3.7 mg</strong></td>
<td><strong>110 IU</strong></td>
</tr>
</tbody>
</table>


Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Identify and compare the nutrient composition of fresh, frozen, canned, and dried fruits and fruit juices. Select types of fruit familiar to consumers in your area, and use the USDA Home and Garden Bulletin Number 72, Nutritive Value of Foods [http://www.nal.usda.gov/fnic/foodcomp/Data/HG72/hg72_2002.pdf](http://www.nal.usda.gov/fnic/foodcomp/Data/HG72/hg72_2002.pdf) to evaluate the amount of vitamin C, vitamin A, and fiber in each type. Values may differ slightly according to the selection from the website, as several forms are generally offered for each food. (For example, there may be values for unsweetened and uncooked dried apricots, sweetened and uncooked dried apricots, unsweetened and cooked dried apricots, and sweetened and cooked dried apricots.) Values will not be available for all forms of all foods. (For instance, dried watermelon is not commonly available.)

<table>
<thead>
<tr>
<th>Type of Fruit</th>
<th>Vitamin C Content of 1 Cup Fresh</th>
<th>Vitamin C Content of 1 Cup Frozen</th>
<th>Vitamin C Content of 1 Cup Canned</th>
<th>Vitamin C Content of ½ Cup Dried</th>
<th>Vitamin C Content of 1 Cup Juice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>3 mg</td>
<td>4 mg</td>
<td>1 mg</td>
<td>2 mg</td>
<td></td>
</tr>
<tr>
<td>Apricots</td>
<td>10 mg</td>
<td>10 mg</td>
<td>9.5 mg</td>
<td>8 mg</td>
<td></td>
</tr>
<tr>
<td>Blackberries</td>
<td>30 mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blueberries</td>
<td>20 mg</td>
<td>2 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cantaloupes</td>
<td>63 mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cherries</td>
<td>10 mg</td>
<td>12 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grapes</td>
<td>6 mg</td>
<td></td>
<td>2 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td>12 mg</td>
<td>236 mg</td>
<td>7 mg</td>
<td>6 mg</td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td>7 mg</td>
<td></td>
<td>4 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberries</td>
<td>88 mg</td>
<td>106 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watermelons</td>
<td>15 mg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td>30.3 mg</td>
<td>115 mg</td>
<td>27</td>
<td>4.4</td>
<td>43.2</td>
</tr>
</tbody>
</table>
Vitamin C is often added to frozen products and juice. Because vitamin C is sensitive to heat and is water soluble, processing foods decreases the amount of vitamin C. The vitamin C leaches out of the fruit during cooking or soaking, and the heat of cooking destroys it during canning.

<table>
<thead>
<tr>
<th>Type of Fruit</th>
<th>Vitamin A Content of 1 Cup Fresh</th>
<th>Vitamin A Content of 1 Cup Frozen</th>
<th>Vitamin A Content of 1 Cup Canned</th>
<th>Vitamin A Content of ½ Cup Dried</th>
<th>Vitamin A Content of 1 Cup Juice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>50 IU</td>
<td>0 mg</td>
<td>0 IU</td>
<td>0 IU</td>
<td></td>
</tr>
<tr>
<td>Apricots</td>
<td>3,303 IU</td>
<td>4,510 IU</td>
<td>4,275 IU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackberries</td>
<td>290 IU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blueberries</td>
<td>140 IU</td>
<td>101 IU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cantaloupes</td>
<td>6,540 IU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cherries</td>
<td>584 IU</td>
<td>1,660 IU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grapes</td>
<td>140 IU</td>
<td>none</td>
<td>15 IU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td>2,230 IU</td>
<td>710 IU</td>
<td>1,100 IU</td>
<td>1,645 IU</td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td>30 IU</td>
<td>trace</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strawberries</td>
<td>90 IU</td>
<td>61 IU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watermelons</td>
<td>556 IU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td><strong>970.2 IU</strong></td>
<td><strong>291 IU</strong></td>
<td><strong>1,131 IU</strong></td>
<td><strong>1,263 IU</strong></td>
<td><strong>658 IU</strong></td>
</tr>
</tbody>
</table>
Type of Fruit | Fiber Content of 1 Cup Fresh | Fiber Content of 1 Cup Frozen | Fiber Content of 1 Cup Canned | Fiber Content of ½ Cup Dried | Fiber Content of 1 Cup Juice
---|---|---|---|---|---
Apples | 3.7 g | | 0.7 g | 2.8 g | 0.2 g
Apricots | 1.6 g | | 3.9 g | 3.2 g | 1.5 g
Blackberries | 7.6 g | | | |
Blueberries | 3.9 g | 4.8 g | | |
Cantaloupes | 1.3 g | | | |
Cherries | 3.2 g | | 2.7 g | | |
Grapes | 1.6 g | | | 2.9 g | 0.3 g
Peaches | 2.0 g | 4.5 g | 3.2 g | 1.6 g | |
Pears | 4.0 g | | 4.0 g | | |
Strawberries | 3.8 g | 4.8 g | | | |
Watermelons | 0.8 g | | | | |
**AVERAGE** | **2.9 g** | **3.8 g** | **2.8 g** | **2.6 g** | **0.5 g**

I.U. = International Units. International Units are the typical units of measurement for vitamin A.
In general, processing decreases fiber content of foods, especially if peels and small seeds are removed. When juice is made, nearly all fiber is removed from the fruit. For this reason, it is especially important to eat whole fruits and vegetables.
# Fruit Nutrients and Producers

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Season</th>
<th>Nutrients</th>
<th>Producers</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Kentucky Counties

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
## Fruit Variety Comparison

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Variety</th>
<th>Texture</th>
<th>Visual Difference</th>
<th>Flavor</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Which variety of each fruit did you like the best? _______________________________________

__________________________________________________________________________________

Considering your favorite fruit and your favorite variety, what recipes could your favorite variety be used for? _______________________________________

__________________________________________________________________________________

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
The Pawpaw & American Persimmons

Two fruits that are indigenous to Kentucky include the pawpaw and the American persimmon. Read the following information and use the websites listed below to do additional research on one or both of the fruits. Present the information to the class.

The pawpaw:

Pawpaw trees were discovered in 1541 by the Spanish explorer, Hernando DeSoto, on an excursion into the Mississippi Valley, and he sent samples of this plant back to Europe. William Bartram, in 1776, wrote in his botanical book, Travels, that he found pawpaw trees growing on the Alatamaha River in Georgia and in east Florida. He described pawpaw trees as “Annona incarna.” The name later was updated by modern taxonomists. “The fruit the size of a small cucumber… containing a yellow pulp of the consistence of a hard custard, and a very delicious, wholesome food.” This fruit is agreeably flavored and considered to be the largest native fruit of North America. Pawpaw trees are said to be endangered, or threatened, in the states of New York and New Jersey, in the forests where it grows naturally.

The eastern United States as a native tree. Mature pawpaw trees produce fruits 2 inches wide by 10 inches long, looking and tasting very much like a banana. The fruit may be purchased at many outdoor markets in West Virginia, Kentucky and Tennessee, etc. The pawpaw pulp has the consistency of creamy custard and may be eaten raw and baked, or it can be used as a pie filling. The trees grow about 15 feet tall and have been known to produce as much as 60 pounds of pawpaws per tree. Some individual pawpaws weigh up to a pound each. (Malcolm, 2006)

The American persimmon:

The golden orange to red fruits are very sweet when fully ripened. The American or common persimmon, Diospyros virginiana, is a slow growing, moderately sized tree native to Kentucky. The fruits are about 1 to 2 inches in diameter. Cultivated varieties may have improved quality and lose their astringency earlier in the fall. The Asian or Japanese persimmon Diospyros kaki, is not hardy in Kentucky.

Fruits are hand-picked with care to maintain the cap on the fruits if it is to be marketed fresh. Bearing trees may yield 35 to 75 pounds of fresh fruit per tree. Mature fruit may be yellow, orange, bright red, or blue in color. Fruit becomes soft and mushy while ripening. Persimmons are very astringent due to the presence of alum when not fully ripe. It is popularly believed that a hard frost is required to sweeten the fruit, but actually persimmons just require a long period for ripening. Edible fruits often hang on the trees through fall and even into winter unaffected by freezing temperatures. (Strang, 2008)
References:


Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Introduction

“Where, oh where, is dear little Nellie? Way down, yonder in the pawpaw patch.” This traditional American folk song was quite popular once, and fall hunting for pawpaws in the woods is still a cherished tradition for many families in Kentucky. In 1990, Kentucky State University (KSU) began a research program with the aim of developing pawpaw as a new tree-fruit crop for Kentucky. With a unique mango, banana, and pineapple flavor, and a tropical fruit-like aroma, this fruit has fresh market appeal for farmers’ markets and direct sales to restaurants, and processing potential for the orange-yellow pulp to be used as an ingredient in gourmet items such as ice cream, wine, and pies. Pawpaws are found throughout Kentucky’s forests as a native understory tree, often along streams and rivers. The trees produce root suckers, forming large patches of often over 500 stems. Patches serve an important role in ecosystems around rivers and streams, providing fruit and cover for animals (deer, raccoons, squirrels, etc.), reducing erosion, and enhancing insect biodiversity. Zebra swallowtail butterfly larvae feed exclusively on pawpaw foliage. If you are a woodland owner in Kentucky, you may want to consider either: 1) planting pawpaw seedlings to assist in erosion control, attract wildlife, and diversify your current woodlands area, or 2) planting grafted pawpaw varieties in an orchard adjoining your current woodland area or timber planting.

Site Selection

For a woodland planting site, pawpaws will thrive in areas with well-drained soils that are often moist, especially near streams, but are not frequently waterlogged. Pawpaw orchards should be planted in well-drained soils in areas near woodlands or timber plantings which will serve as windbreaks for the orchard. Pawpaws will grow in shaded areas; however, fruit production will be greatest in areas of full sun. Fruit set can be low in native patches due to shading, lack of pollinators (flies), and failure of cross pollination (which requires at least two genetically different pawpaw trees). Low areas in valleys have poor air drainage and pooling of cold air can lead to spring frost damage to pawpaw flowers in April and May and cause crop failure.

Plant Material and Planting Time

Use pawpaw seedlings in woodland areas where they can spread by root suckering. Remember that the seedlings are not identical to their parents and fruit quality cannot be guaranteed. Fruit may be of high quality or poor quality. Seedling trees must undergo a period of juvenility; therefore, seedlings will flower 4-8 years after planting. Pawpaw seed can be removed from wild-collected or cultivated fruit, washed in a dilute bleach solution (5%), and be placed in ziplock bags with moist peat moss for storage.
Bags should be kept in the refrigerator for at least three months (stratification), or until planting, to satisfy the seed chilling requirement. Never let pawpaw seed dry out or freeze; this will kill the seed. If sowing into containers, use a peat based potting soil and tall pots to accommodate the strong taproot. The Kentucky Division of Forestry sells seedlings to the public that have been grown from high-quality KSU pawpaw seed (www.forestry.ky.gov/seedling). Root suckers in native patches usually have poorly developed root systems and are difficult to transplant. In orchards, space trees 8 feet apart within rows and 18 feet between rows to promote pollination. Woodland planted trees should be planted 8 to 100 feet apart to optimize pollination and spread of root suckers.

For fruit production in orchards that adjoin woodland areas, purchase named pawpaw varieties that have been grafted or budded onto seedling rootstock. Grafted or budded trees produce high quality fruit 3 to 5 years after planting. The pawpaw varieties ‘Sunflower’, ‘Overleese’, ‘NC-1’, ‘Wabash’, ‘Shenandoah’, ‘Potomac’, and KSU8-2 are recommended for planting based on Kentucky trials. Root suckers from grafted trees will not be true to the variety and should be removed. Spring planting (April-May) has been more successful in Kentucky than fall planting.

**Early Care and Establishment**

Newly planted pawpaw trees do not compete well with grass, weeds, or other plants. Place straw or woodchip mulch at 6-8 inches in depth extending out at least 3 feet from the trunk to control weeds and retain moisture. Water and fertilize the trees, especially during the first 2 years of establishment.

**Harvest**

Depending on the variety, fruit ripen in late-August to early-October. Fruit ripen on the same tree over about a 2-week period, due to an extended spring flowering period. Pawpaw fruit are ripe when they begin to soften and can be gently pulled off a tree like ripe peaches. Fruit can also be cut from the tree at the stem (peduncle) with a pruning shears to reduce tearing of the skin and fruit injury. Fruit has a 5-7 day shelf-life at room temperature and up to 3 weeks in the refrigerator.

**Economics**

In 2009, pawpaw fruit usually sold for $1 each (about $2 per pound) at farmers’ markets and up to $3 per pound at specialty groceries in Kentucky. Grafted varieties will come into full production by the 6th year after planting and produce 50-75 pounds of fruit per tree each year. Seedling trees usually have lower yields and fruit quality can be low (e.g., small fruit, bitter aftertaste).

**References—Websites**

The Kentucky State University Pawpaw Website: [http://www.pawpaw.kysu.edu](http://www.pawpaw.kysu.edu).

The Kentucky Division of Forestry pawpaw seedling order form: [www.forestry.ky.gov/seedling](http://www.forestry.ky.gov/seedling).

The KSU Pawpaw Nurseries List: [http://www.pawpaw.kysu.edu/pawpaw/nursist.htm](http://www.pawpaw.kysu.edu/pawpaw/nursist.htm).

Educational programs of the Cooperative Extension System serve all people regardless of race, color, national origin, sex, religion, age, disability, political beliefs, marital or familial status. Issued in furtherance of the Cooperative Extension Work Act of September 29, 1977, in cooperation with the U.S. Department of Agriculture.
American Persimmon

Introduction
The American or common persimmon, *Diospyros virginiana*, is a slow growing, moderately sized tree native to Kentucky. Fruit are about 1 to 2 inches in diameter. Unripe fruit, which is high in tannins, has a bitter astringent flavor. The golden orange to red fruit are very sweet when fully ripened and astringency is reduced. Cultivated varieties may have improved quality and lose their astringency earlier in the fall.

Marketing and Market Outlook
The Asian persimmon is more commonly grown commercially in the U.S.; however, efforts in some states, including Indiana, have been underway to commercialize the American persimmon. These trees are normally sold by nurseries that specialize in less common fruits and nuts.

Fruit are usually marketed fresh and persimmons are occasionally found at farmers markets across Kentucky. The “slow foods movement” has increased interest in this crop. The fruit can also be processed and the pulp sold as a frozen product. Value-added products include persimmon puddings, cookies, cakes, custards, ice creams, sherbets, and preserves. Fruit may also be dried. Producers marketing persimmons at farmers markets and other direct marketing channels should provide persimmon storage, ripening and use information as many consumers are unfamiliar with the crop. Product sampling in direct markets could be particularly effective.

Production Considerations
*Cultivar selection*
Persimmon cultivars vary in fruit color, size, shape, and astringency. Earliness and tree size may also differ between varieties. Fruit of most varieties contain black flecks in the pulp, which are not attractive in the processed product. ‘Meader,’ ‘Killen,’ ‘Morris Burton,’ and ‘C-100’ are varieties that contain few or no black specks.

Persimmons are normally dioecious; that is, trees produce either male or female flowers on separate trees. These self-infertile trees will require cross pollination with another variety to produce fruit. There is a 90-chromosome American persimmon that is native to the northern U.S. and a 60-chromosome type that is native to Kentucky and the southern U.S. Most of the named varieties are of the 90-chromosome type. When named varieties of the 90-chromosome type are grown in Kentucky and are pollinated by the 60-chromosome type the seeds abort and many of the fruit are seedless or have few seeds. A few American persimmons, such as ‘Meader,’ are self-fruitful and will set seedless fruit.
Site selection, planting, and maintenance
Persimmon is a very adaptable tree, surviving on everything from poor sites to river bottoms, and from partial shade to full sun. However, for best growth and fruit production, moist, well-drained loamy soils and sunny sites are best. Avoid waterlogged soils, as well as those that are drouthy. Production on elevated sites permits a longer freeze-free production period.

Persimmon can be propagated from seeds, cuttings, suckers, and grafts. Plants can be easily produced from seed after a 3-month period of seed stratification. Seedlings that are one to two years old may be transplanted to the orchard. To ensure high quality plants and fruit, however, it is best to plant grafted or budded trees. Persimmon has a long taproot that can make transplanting more difficult. Orchard spacing is determined by the variety.

Young plants should be well-watered to aid in establishment; mature trees are somewhat drought-tolerant. Persimmon trees, which are pruned to open center or modified central leader, require little pruning once they reach bearing size.

Pest management
Persimmon is generally considered free of most pests and diseases, although a few problems have been known to occur. Insect pests include psyllid, persimmon borer, fall webworm, bagworm, hickory horned devil, and twig girdler. The ambrosia beetle is a new pest that is moving into the state and could be a problem, particularly on weak trees. There is interest in varieties that have leaf spot resistance. Persimmon wilt, a fungal disease due to Cephalosporium diospyri, has caused considerable damage in the south, including Tennessee; it may also be present in Kentucky. Songbirds, raccoons, squirrels, and deer are some of the animals that will feed on persimmon fruit.

Harvest and storage
Persimmon trees propagated from seeds begin producing a crop in about 4 to 9 years, while grafted trees can begin fruiting 3 years after planting. It may take as many as 10 years for trees to come into full production. Fruit is hand-picked with care to maintain the cap on the fruit if it is to be marketed fresh. Fruit needs to be handled gently to avoid bruising. Bearing trees may yield 35 to 75 pounds of fresh fruit per tree.

Mature fruit may be yellow, orange, bright red, or blue in color. Fruit becomes soft and mushy while ripening. It is popularly believed that a hard frost is required to sweeten the fruit, but actually persimmons just require a long period for ripening. Edible fruits often hang on the trees through fall, and even into winter, unaffected by freezing temperatures.

Persimmons can be stored just above freezing for approximately 3 months. Ripe fruit that is still astringent can be treated with ethylene or frozen to eliminate the astringency. Drying also removes astringency.

Labor requirements
Labor needs per acre are approximately 60 hours for production, 140 hours for harvest, and 60 hours for packing/grading.

Economic Considerations
Initial investments include land preparation, the purchase of seedlings or grafted trees, and possibly the installation of an irrigation system.

Establishment costs over 3 years for one acre of persimmons are estimated at $8,000. These costs presume 300 trees per acre at a wholesale cost of $20 per tree. Smaller plantings typically involve higher per-tree costs from the nursery. Production costs after Year 4 are estimated at $1,200 per acre, with harvest and marketing costs at $2,250 per acre. This is equal to $2.30 in total costs per pound of persimmon production. Presuming gross returns of $4.125 per acre, or 1,500 pounds at $2.75 per pound, returns to land, capital, and management would be approximately $675 per acre or $0.45 per pound. Growers may be able to reach similar returns for a smaller, well-
managed persimmon planting with well-targeted niche marketing.

Returns will vary widely depending on the market and product use. Prospective growers are encouraged to carefully forecast revenues based on marketable yields and product utilization.

**Selected Resources**

- Common Persimmon (U.S. Forest Service, North Eastern Area)
- Common Persimmon Plant Guide (PLANTS Database, USDA NRCS, 2006)
- Horticultural Improvement of the American Persimmon (The Persimmon Patch, 2007)
  [http://www.simmonfruit.net/persimmon_improvement.html](http://www.simmonfruit.net/persimmon_improvement.html)
- Persimmon (Virginia Tech, 2001)
- Persimmons: An Over-View of Cultivars, Production, Harvesting, and Marketing (Washington State University) 10.68 MB file
- Persimmons, Asian and American (ATTRA, 2010)

---

*Reviewed by John Strang, Extension Specialist (Issued 2008)*
*Reviewed by Shawn Wright, Extension Specialist (Revised 2011)*
*Photos by Frank Bonner, U.S. Forest Service (fruit) & Rasbak, Wikimedia Commons (blossom)*

For additional information, contact your local County Extension agent
Fruit Rollups from Home

- 2 cups unsweetened applesauce or pureed canned pears
- 1 cup pureed blueberries or fruit of choice
- ½ cup sugar (an equivalent measure of sugar substitute may be used)
- ¼ teaspoon cinnamon or nutmeg (optional)

Mix ingredients in a medium-size mixing bowl. (More sugar may be added if mixture is too tart.)

Dehydrator:

Spray dehydrator trays first with cooking spray or line the trays with parchment paper for easy removal. Then pour fruit puree into trays, about 1/8 - to ¼-inch thick. Dehydrate until fruit puree is no longer sticky. Store in an airtight container on the counter, refrigerator or freezer.

Oven:

Line a rimmed baking sheet with microwaveable-safe plastic wrap or parchment paper. Pour the puree onto baking sheet, about 1/8 - to ¼-inch thick. Place the baking sheet in a preheated oven of 150 degrees Fahrenheit for 8 to 12 hours or until the fruit puree is no longer sticky. Cut it with a knife or pizza cutter. Store in an airtight container on the counter, refrigerator or freezer.

Homemade Fruit Rollups with Sugar Substitute

Source: S. Bastin (2012), personal communication.
Kentucky Strawberries

Season: May through June.

Nutrition Facts: Strawberries are low in calories and high in nutrients. One cup of strawberries contains 55 calories. Strawberries are a great source of vitamin C. They also contain vitamin A, iron, fiber, and folic acid. Folic acid is especially important for childbearing women.

Selection: Choose fully ripened, bright red berries. Strawberries do not ripen after they have been picked. Berries should be plump and have a natural shine and bright green, fresh-looking caps. Use strawberries as soon after picking as possible for the best flavor and highest nutritional value.

Storage: Store strawberries in the refrigerator, covered, unwashed, and with the cap on. Do not crowd. If you have the space, gently spread the berries on a cookie sheet and cover with plastic wrap. Use berries within two to three days.

Handling: Handle strawberries gently. Never remove the caps before washing. The caps prevent water from soaking into the berry, which lessens the flavor and changes the texture.

To wash, cover berries in cold water and lift gently out of the water to drain. Dry by placing berries in a single layer on paper towels. After washing, remove the caps if necessary. Give the cap a gentle twist or use the point of a sharp paring knife or pointed spoon. Pat berries dry with paper towels before serving whole or sliced, fresh, or cooked.

Freezer Jam

3 cups fresh strawberries, crushed
5 cups sugar
1 package powdered pectin
1 cup water
Sort and wash fully ripened berries. Drain. Remove caps and stems. Crush berries and place into a large mixing bowl. Add sugar, mix well, and let stand for 20 minutes, stirring occasionally. Dissolve the pectin in the water; bring to a boil for 1 minute. Add pectin solution to the fruit and sugar mixture and stir for 2 minutes. Ladle the jam into jelly jars or suitable freezer containers, leaving ½-inch headspace. Cover the containers and let stand for 24 hours or until jam is set. Yield: nine 6-ounce jars. Jam can be held in the refrigerator three weeks and frozen up to one year.

Nutritional Analysis (per 1 tablespoon serving):
45 calories, 0 g fat, 0 g protein, 11 g carbohydrate, 0 mg cholesterol, 0 mg sodium.

Prepared by Sarah Ball Brandl, Family and Consumer Sciences, Limited Resource Audience Coordinator. Adapted from Kentucky Strawberries (FSHE-2). Reviewed by Dr. Terry Jones, Extension Specialist for Horticulture, and Charles Tyron Back, Extension Associate for Horticulture, University of Kentucky.

For more information, contact your county’s Extension agent for Family and Consumer Sciences or visit the Web site for Family and Consumer Sciences, College of Agriculture, University of Kentucky, at <www.ca.uky.edu/agcollege/fcs>.

Educational programs of the Kentucky Cooperative Extension Service serve all people regardless of race, color, age, sex, religion, disability, or national origin.
World Map
LESSON 5

OILS

Sydney Hughes, 6th grade, Rockcastle County Middle School

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Facilitator Guide
Lesson 5: Only a Little Oil Will Do!

Lesson Outcomes:

1. Identify the different types of oils and fats.
   Contributing activities
   • Activity 1
   • Activity sheet 5-1
   • Handout 5-1
   • NEP-207A
   • NEP-207B

2. Explain the difference between oils and saturated fats.
   Contributing activities
   • Activity 1
   • Activity sheet 5-1
   • Handout 5-1
   • NEP-207A
   • NEP-207B

3. Identify USDA Dietary Guidelines and serving sizes.
   Contributing activities
   • Introduction Q & A
   • Activity 1
   • Activity sheet 5-1
   • Handout 5-1
   • NEP-207A
   • NEP-207B

4. Explain the importance of oils and fats in the diet and why you should limit intake.
   Contributing activities
   • Activity 1
   • Activity sheet 5-1

5. Identify which Kentucky crops can be used to produce different types of oils and fats.
   Contributing activities
   • Activity 3
   • Activity sheet 5-2
   • Additional activity 5

6. Locate and map Kentucky producers of crops used for oil and fat production.
   Contributing activities
   • Activity 3
   • Activity sheet 5-2
   • Additional activity 6

7. Identify hydrogenated oils and what it provides for the diet.
   Contributing activities
   • Activity 1
   • Handout 5-1
   • Activity 2
   • NEP-207A
   • NEP-207B

Materials and Equipment:

• MyPlate Worksheet NEP-201C or USDA (completed in lesson 1)
• Activity sheet 5-1, How Much Fat Is in It?
• Handout 5-1, Know Your Fats
Lesson Initiation

Bell ringer/class opener:

Write on the board or ask students to “Make a list of all the oils and fats you can think of that come from, or are produced in Kentucky.”

Lesson Introduction

Review last lesson

(Scene) Last time we talked about the fruit group of MyPlate. What foods belong in the fruit group? Did anyone try a new fruit?

Q: How many groups are included on MyPlate?

A: We say five groups, but what about butter, oil, shortening, and lard?

Q: Are these listed in any of the five MyPlate food groups?

A: No they’re not. Oils are not a food group, but they do provide essential nutrients and are, therefore, included in USDA recommendations for what to eat. Note that only small amounts of oils and fats are recommended.

Most of the fats you eat should be polyunsaturated (PUFA) or monounsaturated (MUFA) fatty acids. Oils are the major source of MUFAs and PUFAs in the diet. PUFAs contain some fatty acids that are necessary for health—called “essential fatty acids.”

Activity 1

Use handout 5-1 and activity sheet 5-1 with this activity.

When counting calories, there is no difference between fats. All fats have 9 calories per gram. However, different types of fat affect the body’s health in different ways. Some are better than others.

See NEP-207A_Oils publication, then have students determine the number of teaspoons of oil they need per day. Review the information provided about the different types of fats. See NEP-207B_Solid Fats and Added Sugars (SoFAS) Know the Limits publication, then have students determine their daily limit for calories from solid fats and sugars (SoFAS) and complete “Limiting Calories from Added Sugars” exercise. Have students complete “How Much Fat Is in It?” Activity sheet 5-1.

Activity 2

Divide student group in half to have two debate teams. Have one group debate for hydrogenation and the other group debate against hydrogenation. Each team should research both sides to prepare for the debate. Each team should have written points for their side and against the opposing side.

Activity 3

Use activity sheet 5-2 Kentucky Oils and Fats; Where to Find Them.

Now that the students know the sources of oil and fats we need to discover if Kentucky produces products for oils and fats and if Kentucky has any oil processors.
Q: First, what kinds of crops/livestock can be used to produce fats and oils?
• Soybeans
• Corn
• Vegetables
• Pork
• Dairy cows
• Goats
• Peanuts

All of these can be produced in Kentucky.

Have students get into groups or do individual work to research and map producers and processors of Kentucky oils and fats. Use Activity sheet 5-2 Kentucky Oils and Fats; Where to Find Them.

Resources:
Kentucky Market Maker http://ky.marketmaker.uiuc.edu/
Fresh Food Central http://www.freshfoodcentral.com/

Vegetables:
Characteristics and Production Cost of U.S. Corn Farms http://www.ers.usda.gov/Publications/SB974-1/

Specialty Soybeans http://www.uky.edu/Ag/NewCrops/introsheets/specialtysoy.pdf
Soybean Production http://extension.agron.iastate.edu/soybean/production_planting.html
Soybean Production http://www.ag.ndsu.edu/pubs/plantsci/rowcrops/a250w.htm

Grains:

Livestock:
USDA Agricultural Marketing Service http://www.ams.usda.gov/AMSv1.0/E-extension
E-extension Hogs, Pigs and Pork www.extension.org/swine

Additional Activities
Homemade butter without a churn handout 5-2
Contributing activity for objective 5

Tour a butter or oil processing plant.
Contributing activity for objective 5 and 6
• Owensboro Grain Edible Oils – 719 E. 2nd Street., Owensboro, KY 42303, 270-926-2032
Reference:

# Kentucky Farm 2 School
## Grades 9-10: Lesson 5
### Only A Little Oil Will Do!

<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Informational</strong></td>
<td>RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</td>
</tr>
</tbody>
</table>
| **Reading Science & other Technical** | RST.9-10.1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.  
RST.9-10.2. Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.  
RST.9-10.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.  
RST.9-10.7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.  
RST.9-10.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts. |
| **Writing**                     |   |
| **Writing Science & other Technical** | W.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
W.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation. |
| **Speaking & Listening**       | SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task. |
# Kentucky Core Academic Standards

## Reading

<table>
<thead>
<tr>
<th>Reading Informational</th>
<th>RI.11-12.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. RI.11-12.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10). RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</th>
</tr>
</thead>
</table>

## Reading Science & other Technical

<table>
<thead>
<tr>
<th>Reading Science &amp; other Technical</th>
<th>RST.11-12.1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. RST.11-12.2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. RST.11-12.8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. RST.11-12.9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</th>
</tr>
</thead>
</table>

## Writing

| Writing | W.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. W.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| Writing Science & other Technical | WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
WHST.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.  
WHST.11-12.9. Draw evidence from informational texts to support analysis, reflection, and research. |
|---|---|
| Speaking & Listening | SL.11-12.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.  
SL.11-12.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks |
Know Your Fats

• When counting calories, there is no difference between fats.
• All fats have 9 calories per gram.
• Different types of fat affect the body’s health in different ways. Some are better than others.
• NEP 207A Oils
• NEP 207B Solid Fats and Added Sugars (SoFAS)
• Fats are needed in the diet but should be eaten in moderation.

Facts about FAT

• The calories in food come from carbohydrates, proteins, and fats. A gram of carbohydrate contains 4 calories. A gram of protein also contains 4 calories. A gram of fat, though, contains 9 calories — more than twice the amount of the other two.
• It’s a bad idea to try to avoid fat completely, though, especially for teens. A certain amount of fat is necessary for development, especially during puberty when the body grows quickly.
• Fats are also needed to absorb certain vitamins that are essential for proper growth. Vitamins A, D, E, and K are fat soluble, meaning they can only be absorbed if there is fat in a person’s diet. Also, fat cells act as insulation to keep the body warm and help protect the nerve cells.
• As with fat, you need a certain amount of calories in your diet to fuel your body. In fact, nutritionists do not recommend calorie counting (keeping track of the number of calories in everything that you eat) for teens unless recommended by a doctor. So if you are concerned about your weight, speak to your doctor (The Nemours Foundation, 2011).

• Trans fats are formed during a process called hydrogenation. In this process, hydrogen is added to vegetable oils to make shortening or margarine, a more solid product. Hydrogenation lengthens the shelf life and improves the flavor and texture of foods. The intake of hydrogenated fats raises blood cholesterol levels.
• Foods with trans fats include:
  • Vegetable shortening
  • Stick margarine
  • Snack foods such as potato, corn, and tortilla chips; candy; packaged or microwave popcorn
  • Commercially baked foods such as pastries, donuts, cookies
  • Deep-fried food and snacks

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
### How Much Fat is in It?

<table>
<thead>
<tr>
<th>Food</th>
<th>Amount</th>
<th>Fat Grams</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margarine</td>
<td>1 teaspoon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>1 teaspoon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sour cream</td>
<td>2 tablespoons (6 teaspoons)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salad dressing</td>
<td>1 tablespoon (3 teaspoons)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cream cheese</td>
<td>1 ounce</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mayonnaise</td>
<td>1 tablespoon (3 teaspoons)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Kentucky Oils and Fats; Where To Find Them!

• Soybeans
• Corn
• Vegetables
• Pork
• Dairy cows
• Goats
• Peanuts

All of these can be grown in Kentucky. Get into groups or do individual work to research and map producers and processors of Kentucky oils and fats. Each group or individual will present information to the class.

Resources:

Kentucky Market Maker [http://ky.marketmaker.uiuc.edu/](http://ky.marketmaker.uiuc.edu/)


Vegetables:


Specialty Soybeans [http://www.uky.edu/Ag/NewCrops/introsheets/specialtysoy.pdf](http://www.uky.edu/Ag/NewCrops/introsheets/specialtysoy.pdf)

Soybean Production [http://extension.agron.iastate.edu/soybean/production_planting.html](http://extension.agron.iastate.edu/soybean/production_planting.html)

Soybean Production [http://www.ag.ndsu.edu/pubs/plantsci/rowcrops/a250w.htm](http://www.ag.ndsu.edu/pubs/plantsci/rowcrops/a250w.htm)

Livestock:


E-extension Hogs, Pigs and Pork [www.extension.org/swine](http://www.extension.org/swine)
Homemade Butter (Without a Churn)

- 1 pint of heavy cream
- 1 large clean glass jar (quart size will work) with a tight-fitting lid
- 1 marble

Refrigerate jar so it is cold. Place a clean marble into jar then pour cream into jar and make sure the lid is secure. Shake vigorously until chunks start to form about 15 minutes. Once chunks develop, pour the remaining liquid off. The liquid is buttermilk and the solid chunks are butter.

If recipe made 6 servings

<p>| Nutrition Facts |
|-----------------|-----------------|-----------------|
| Serving Size (80g) | Calories 280 | Calories from Fat 270 |
| Servings Per Container | % Daily Value* | % Daily Value* |</p>
<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories</th>
<th>% Daily Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat 30g</td>
<td>46%</td>
<td>Saturated Fat 18g</td>
</tr>
<tr>
<td>Trans Fat 1g</td>
<td></td>
<td>Cholesterol 110mg</td>
</tr>
<tr>
<td>Sodium 30mg</td>
<td>1%</td>
<td>Total Carbohydrate 2g</td>
</tr>
<tr>
<td>Dietary Fiber 0g</td>
<td></td>
<td>Sugars 0g</td>
</tr>
<tr>
<td>Protein 2g</td>
<td></td>
<td>Vitamin A 25%</td>
</tr>
<tr>
<td>Calcium 6%</td>
<td></td>
<td>Iron 0%</td>
</tr>
</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

<table>
<thead>
<tr>
<th>Calories</th>
<th>Fat</th>
<th>Carbohydrate</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000</td>
<td>less than 65g</td>
<td>less than 30g</td>
<td>25g</td>
</tr>
<tr>
<td>2,500</td>
<td>less than 80g</td>
<td>less than 37g</td>
<td>less than 30g</td>
</tr>
</tbody>
</table>

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
OILS

The U.S. Department of Agriculture’s Dietary Guidelines recommend getting about 10 percent of our total calories from healthful oils. Good sources of oils include fish, nuts, and vegetable oils. Consult the chart below to see how much oil you should eat each day.

<table>
<thead>
<tr>
<th>Recommended Daily Calories</th>
<th>Recommended Amount of Oil Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>3 teaspoons</td>
</tr>
<tr>
<td>1,200-1,400</td>
<td>4 teaspoons</td>
</tr>
<tr>
<td>1,600-1,800</td>
<td>5 teaspoons</td>
</tr>
<tr>
<td>2,000-2,200</td>
<td>6 teaspoons</td>
</tr>
<tr>
<td>2,400</td>
<td>7 teaspoons</td>
</tr>
<tr>
<td>2,600-2,800</td>
<td>8 teaspoons</td>
</tr>
<tr>
<td>3,000</td>
<td>10 teaspoons</td>
</tr>
<tr>
<td>3,200</td>
<td>11 teaspoons</td>
</tr>
</tbody>
</table>

I need about ____ teaspoons of oil every day.

**Why do we need oils?**

Oils are a type of fat. The body needs fat to function normally. Fat:

- Provides energy
- Improves the taste of food
- Gives a feeling of fullness
- Aids in the absorption of fat-soluble vitamins (A, D, E, and K)
- Insulates and protects internal organs
- Provides essential fatty acids for growth and many body processes

When counting calories, there is no difference between fats. All fats have 9 calories per gram. One teaspoon of oil provides 4 grams of fat and 36 calories.

**Unsaturated fats**

Different types of fat affect the body’s health in different ways. Oils are usually unsaturated fats. Unsaturated fats:

- Are liquid or soft at room temperature
- May help lower blood cholesterol and risk of heart disease when used in place of saturated fats
- Include monounsaturated and poly-unsaturated oils
Sources of unsaturated fat include:

A. Polyunsaturated fats:
   • safflower
   • sesame seeds
   • sunflower seeds
   • corn
   • soybeans
   • nuts
   • seeds

B. Monounsaturated fats:
   • canola oil
   • olive oil
   • peanut oil
   • avocados

Watch out for tropical oils!

Coconut oil, palm kernel oil, palm oil, and cocoa butter are tropical oils. Unlike other plant oils, they contain a lot of saturated fatty acids. Coconut oil contains 92 percent, palm kernel oil has 82 percent, and palm oil has 50 percent. The high content of saturated fatty acids in these oils can increase blood cholesterol levels and the risk for heart disease. Tropical oils are found mostly in packaged cakes, cookies, and salty “snack foods.”
SOLID FATS AND ADDED SUGARS (SoFAS)

Know the Limits

The U.S. Department of Agriculture’s Dietary Guidelines recommend limiting daily calories from solid fats and added sugars (SoFAS) to no more than 5 to 15 percent of total calories. What is your daily limit for calories from SoFAS?

Limits for Calories from Solid Fats and Added Sugars (SoFAS)

<table>
<thead>
<tr>
<th>Recommended Daily Calories</th>
<th>Limit for Calories from SoFAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>140</td>
</tr>
<tr>
<td>1,200-1,600</td>
<td>120</td>
</tr>
<tr>
<td>1,800</td>
<td>160</td>
</tr>
<tr>
<td>2,000</td>
<td>260</td>
</tr>
<tr>
<td>2,200</td>
<td>270</td>
</tr>
<tr>
<td>2,400</td>
<td>330</td>
</tr>
<tr>
<td>2,600</td>
<td>360</td>
</tr>
<tr>
<td>2,800</td>
<td>400</td>
</tr>
<tr>
<td>3,000</td>
<td>460</td>
</tr>
<tr>
<td>3,200</td>
<td>600</td>
</tr>
</tbody>
</table>

My daily limit for calories from SoFAS is _______ calories.

Limiting Calories from Solid Fats

When counting calories, there is no difference between fats. All fats have 9 calories per gram. However, different types of fat affect the body’s health in different ways.
**Saturated Fats:**
- Are usually solid at room temperature (e.g., butter, hydrogenated shortening, and lard)
- Raise blood cholesterol, increasing risk for heart disease

**Sources of saturated fat include:**
**A. Fat from animals**—beef, veal, lamb, pork, lard, poultry fat, butter, cream, all milk except skim milk, cheese, and ice cream

**B. Fat from plants**—tropical oils, including coconut oil, palm oil, palm kernel oil, and cocoa butter

**Trans Fats (trans-fatty acids):**
- Are formed when saturated fats are made from unsaturated oils through a process called hydrogenation (e.g., hydrogenated vegetable oil, shortening, stick margarine),
- Are present in animal products
- Raise blood cholesterol

**Sources of trans fat include:**
Vegetable shortenings, some margarines, flaky pastries and other bakery products, meat, foods fried in shortening (such as French fries), and processed foods.

**Tips for Limiting Saturated Fat and Trans Fats**
- Read labels to find fat, saturated fat, and trans fat.
- Limit servings of meat to amounts recommended by MyPlate eating plan.
- Use fat-free or low-fat dairy products.
- Follow MyPlate eating plan recommendations for substituting dry beans and peas for meat.
- When possible, use unsaturated oils in place of shortenings, butter, margarine, or lard.
- Use soft margarines as a substitute for butter. Choose trans fat-free margarines with no more than 2 grams of saturated fat per tablespoon.
- Limit intake of commercially fried foods, such as French fries, doughnuts, and fried chicken. These are high in trans fats.
Limiting Calories from Added Sugars

Sugar gives us calories but no vitamins, minerals, or other nutrients. It is often referred to as an “empty calorie” food. Too much sugar in the diet can lead to excess weight. It can replace calories from nutritious foods. It can rob the body of nutrients needed for good health. Eating sugar over and over again promotes tooth decay.

Sugar provides 4 calories per gram. One teaspoon of sugar is 4 grams. How many calories are in 1 teaspoon of sugar?

(4 grams X 4 calories/gram = ______ calories in 1 teaspoon of sugar)

If you add 2 teaspoons of sugar to your morning coffee, how many calories from SoFAS can you eat during the rest of the day?

1. Multiply the number of calories in one teaspoon of sugar by 2:

   16 calories/teaspoon X 2 teaspoons = ______ calories

2. Consult the SoFAS chart to find your daily limit for calories from SoFAS. Subtract the number of calories in 2 teaspoons of sugar from your daily limit:

   _____ calories/day - _____ calories in 2 teaspoons of sugar = _____ calories

---

### How Much Fat Is in It?

<table>
<thead>
<tr>
<th>Food</th>
<th>Amount</th>
<th>Fat Grams</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margarine</td>
<td>1 teaspoon</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>Butter</td>
<td>1 teaspoon</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>Shortening</td>
<td>1 teaspoon</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>Sour cream</td>
<td>2 tablespoons (6 teaspoons)</td>
<td>6</td>
<td>54</td>
</tr>
<tr>
<td>Salad dressing</td>
<td>1 tablespoon (3 teaspoons)</td>
<td>7</td>
<td>63</td>
</tr>
<tr>
<td>Cream cheese</td>
<td>1 ounce</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>Mayonnaise</td>
<td>1 tablespoon (3 teaspoons)</td>
<td>11</td>
<td>99</td>
</tr>
</tbody>
</table>
Most of the added sugar in our diets comes from sweets. It could be from soft drinks, candy, desserts, jams, jellies, syrups, or table sugar. The amount of sugar being added at the table has slowed down in recent years. However, the amount of sugar being added during processing has increased. You might be surprised at some of the foods that contain sugar. Bottled salad dressings and peanut butter may contain sugar. To find out, look at the ingredient list. All ingredients are listed in order of weight. The one that has the greatest weight is listed first. Sugar may have any of these names:

- Brown sugar
- Corn syrup
- Fructose
- Glucose
- Honey
- Molasses
- Sucrose
- High-fructose corn syrup
- Corn sweetener
- Dextrose
- Galactose
- Sugar alcohols
- Maltose
- Nutritive sweeteners
- Sugar

Look at the Nutrition Facts label on a product to find the grams of sugar listed under “Total Carbohydrate.” How many grams of sugar are in the breakfast bar example shown here?

_________________________

What are the sources of added sugar in the breakfast bar?

1. ______________________
2. ______________________
3. ______________________
4. ______________________
5. ______________________
### Nutrition Facts - Breakfast Bar

<table>
<thead>
<tr>
<th>Serving Size (21g)</th>
<th>Servings Per Container</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount Per Serving</strong></td>
<td></td>
</tr>
<tr>
<td>Calories</td>
<td>90</td>
</tr>
<tr>
<td>% Daily Value*</td>
<td></td>
</tr>
<tr>
<td><strong>Total Fat</strong></td>
<td>3g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>0g</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>0mg</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>80mg</td>
</tr>
<tr>
<td><strong>Total Carbohydrate</strong></td>
<td>15g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>1g</td>
</tr>
<tr>
<td>Sugars</td>
<td>6g</td>
</tr>
<tr>
<td><strong>Protein</strong></td>
<td>2g</td>
</tr>
<tr>
<td><strong>Vitamin A</strong></td>
<td>0%</td>
</tr>
<tr>
<td><strong>Vitamin C</strong></td>
<td>0%</td>
</tr>
<tr>
<td><strong>Calcium</strong></td>
<td>0%</td>
</tr>
<tr>
<td><strong>Iron</strong></td>
<td>4%</td>
</tr>
</tbody>
</table>

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

<table>
<thead>
<tr>
<th>Calories:</th>
<th>2,000</th>
<th>2,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>Less than 65g</td>
<td>80g</td>
</tr>
<tr>
<td>Sat Fat</td>
<td>Less than 20g</td>
<td>25g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Less than 300mg</td>
<td>300mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>Less than 2,400mg</td>
<td>2,400mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>300g</td>
<td>375g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>25g</td>
<td>30g</td>
</tr>
</tbody>
</table>

Calories per gram:
- Fat 9 • Carbohydrate 4 • Protein 4

**INGREDIENTS:** FILLING: SUGAR, HIGH FRUCTOSE CORN SYRUP, CORN SYRUP, RASPBERRY PUREE, APPLE PUREE, DEXTROSE, MODIFIED FOOD STARCH, APPLE POWDER, WATER, CITRIC ACID, NATURAL FLAVORS, PECTIN, CARAMEL COLOR, SODIUM CITRATE, SALT, RED 40, SULFUR DIOXIDE (TO PROMOTE COLOR RETENTION). CRUST: ENRICHED FLOUR (WHEAT FLOUR, NIACIN*, REDUCED IRON, THIAMIN MONONITRATE*, RIBOFLAVIN*, FOLIC ACID*), OATMEAL, SUGAR, HIGH FRUCTOSE CORN SYRUP, PARTIALLY HYDROGENATED SOYBEAN OIL (MAY ALSO CONTAIN COTTONSEED OIL), HONEY, DEXTROSE, TRICALCIUM PHOSPHATE (A SOURCE OF CALCIUM), NONFAT DRY MILK, SOY LECITHIN (AN EMLUSIFIER), SALT, SODIUM BICARBONATE, ARTIFICIAL FLAVORS, CINNAMON, YELLOW 5 LAKE, NIACINAMIDE*, VITAMIN A PALMITATE, PYRIDOXINE HYDROCHLORIDE*, RIBOFLAVIN*, THIAMIN MONONITRATE*, RED 40 LAKE, FOLIC ACID*. ICING: SUGAR, WATER, CORN STARCH, GELATIN, HIGH FRUCTOSE CORN SYRUP, ARTIFICIAL COLOR, ARTIFICIAL AND NATURAL FLAVORS, PARTIALLY HYDROGENATED SOYBEAN OIL (MAY ALSO CONTAIN COTTONSEED OIL).

*ONE OF THE B VITAMINS CONTAINS WHEAT, SOY AND MILK INGREDIENTS.
## Where Are the Added Sugars?

<table>
<thead>
<tr>
<th>Food Groups</th>
<th>Added Sugars (teaspoons)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grains</strong></td>
<td></td>
</tr>
<tr>
<td>Bread, 1 slice</td>
<td>0</td>
</tr>
<tr>
<td>Muffin, 1 medium</td>
<td>1</td>
</tr>
<tr>
<td>Cookies, 2 medium</td>
<td>1</td>
</tr>
<tr>
<td>Danish Pastry, 1 medium</td>
<td>1</td>
</tr>
<tr>
<td>Donut, 1 medium</td>
<td>2</td>
</tr>
<tr>
<td>Dry cereal, sweetened, 1 oz.</td>
<td>amount differs (check product label)</td>
</tr>
<tr>
<td>Pound cake, nonfat, 1oz.</td>
<td>2</td>
</tr>
<tr>
<td>Angel food cake, 1/12 tube cake</td>
<td>5</td>
</tr>
<tr>
<td>Cake, frosted, 1/16 average cake</td>
<td>6</td>
</tr>
<tr>
<td>Pie, fruit, 2 crust, 1/6 8” pie</td>
<td>6</td>
</tr>
<tr>
<td><strong>Fruit</strong></td>
<td></td>
</tr>
<tr>
<td>Fruit, canned in juice, 1/2 cup</td>
<td>0</td>
</tr>
<tr>
<td>Fruit, canned in light syrup, 1/2 cup</td>
<td>2</td>
</tr>
<tr>
<td>Fruit, canned in heavy syrup, 1/2 cup</td>
<td>4</td>
</tr>
<tr>
<td><strong>Dairy</strong></td>
<td></td>
</tr>
<tr>
<td>Milk, plain, 1 cup</td>
<td>0</td>
</tr>
<tr>
<td>Chocolate milk, 2%, 1 cup</td>
<td>3</td>
</tr>
<tr>
<td>Low-fat yogurt, plain, 8 ounces</td>
<td>0</td>
</tr>
<tr>
<td>Low-fat yogurt, flavored, 8 ounces</td>
<td>5</td>
</tr>
<tr>
<td>Low-fat yogurt, fruit, 8 ounces</td>
<td>7</td>
</tr>
<tr>
<td>Ice cream or frozen yogurt, 1/2 cup</td>
<td>3</td>
</tr>
<tr>
<td>Chocolate shake, 10 fluid ounces</td>
<td>9</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
</tr>
<tr>
<td>Sugar, jam or jelly, 1 teaspoon</td>
<td>1</td>
</tr>
<tr>
<td>Syrup or honey, 1 tablespoon</td>
<td>3</td>
</tr>
<tr>
<td>Chocolate bar, 1 ounce</td>
<td>3</td>
</tr>
<tr>
<td>Fruit sorbet, 1/2 cup</td>
<td>3</td>
</tr>
<tr>
<td>Gelatin dessert, 1/2 cup</td>
<td>4</td>
</tr>
<tr>
<td>Sherbet, 1/2 cup</td>
<td>5</td>
</tr>
<tr>
<td>Soft drink, 12 fluid ounces</td>
<td>9</td>
</tr>
<tr>
<td>Fruit drink ade, 12 fluid ounces</td>
<td>12</td>
</tr>
</tbody>
</table>

*Note: 4 grams of sugar = 1 teaspoon*
LESSON 6
DAIRY

“Let’s grow healthy the Kentucky proud way!”

Miranda Brown, 6th grade, Rockcastle County Middle School

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Facilitator Guide

Lesson 6: Not Just Milk Alone

Lesson Outcomes:

1. Know which foods are included in the dairy group.
   Contributing activities
   • Activity 1
   • Activity 5
   • NEP-206
   • NEP-206b
   • Handout 6-2
   • Handout 6-3
   • Activity sheet 6-3
   • Activity sheet 6-4
   • Activity sheet 6-5

2. Know the number of USDA recommended personal servings and the sizes from the dairy group.
   Contributing activities
   • Activity 1
   • Activity 7

3. Identify animals that produce food for the dairy group.
   Contributing activities
   • Activity 2
   • Activity Sheet 6-1
   • Activity sheet 6-5

4. Identify different dairy farming techniques.
   Contributing activities
   • Activity 2
   • Activity Sheet 6-1
   • Activity Sheet 6-5

5. Identify different types of milk and milk products and the nutritional difference they provide.
   Contributing activities
   • Activity 3
   • Handout 6-1
   • Handout 6-2
   • Handout 6-3
   • Activity 4
   • Activity sheet 6-2
   • Activity sheet 6-3
   • Activity sheet 6-4
   • FN-AP.004

6. Identify nutrients provided by foods in the dairy group.
   Contributing activities
   • Activity 4
   • Activity sheet 6-2

7. Locate and map different Kentucky dairy farms, processors and distributors
   Contributing activities
   • Activity 6
   • Activity sheet 6-5

Materials and Equipment:

• Computer for research
• NEP 206, Get your Calcium-rich Food
• NEP 206B, Bone Up on Calcium
• Activity sheet 6-1 Dairy Operations
Lesson Initiation

Bell ringer/class opener:

What animals produce milk for human consumption? And what other consumer products can be made from milk?

Lesson Introduction

Review last lesson

(last script)

Last time we talked about the oils and fats. Oils and fats are not considered a food group of MyPlate. Why? They do provide essential nutrients but are not a food group. Did anyone look at the label of an oil or fat that you had at home to see if it was produced in Kentucky? What type of oil or fat it was? Were the fats you found trans fats?

Today we are going to talk about the dairy group of MyPlate. Look back at your MyPlate worksheet, from lesson 1 (NEP-201C and Steps to a Healthier You), to see how many servings of Dairy you should have.

Activity 1

Use NEP-206 – Get Your Calcium-Rich Foods and NEP 206B – Bone Up on Calcium.

Most of our dairy foods come from milk cows but goats also provide us with dairy products. Besides milk, what other foods are listed in the dairy group? Have students brainstorm different dairy products and write them on the board.

(Students may identify additional dairy products)

Today's activity has students research what is equal to the calcium in 1 cup of milk (e.g. 1 cup of milk = 1 1/2 oz natural cheese, 2 oz processed cheese). Use NEP-206 as a handout for this activity and have students complete the questions at the end. In addition to the answered questions, have students find the difference in caloric intake for each item. (They may have listed some foods not on NEP-206 so they may have to do additional research to find that information.) NEP-206B has additional information on calcium content.

Have students refer to the MyPlate activity in the Introductory Lesson to identify their recommended food intake from the dairy group. Students should then develop several food
combinations from the food list, which would allow them to receive their personal USDA recommended daily amount of dairy foods. (Have them use foods they will actually consume. This will give them several realistic ways to reach their USDA recommended amount of Dairy.)

Example:
If the students’ caloric intake level is 2,000 calories, the student would need the equivalent of 3 cups of milk to meet the daily portion of dairy foods. Another way for them to meet this requirement would be to eat 1 cup of yogurt, 1 ½ ounces of natural cheese, and 1 cup of goat milk.

Activity 2
Use activity sheet 6-1 Types of Milk.

(Script)
Where does milk come from? Not the grocery store. Milk comes from cows and goats, but what breed of cows and what breed of goats?

Use activity sheet 6-1 Dairy Operations

General dairy breeds are:

Cattle
• Holstein
• Jersey
• Brown Swiss
• Guernsey
• Ayrshire
• Milking shorthorn

Goats
• Nubian
• LaMancha
• Saanen
• Toggenburg

• Oberhasli
• Nigeran dwarf
• Sable
• Alpine

Resources:
Common breeds of dairy goats in the US [http://www.ansc.purdue.edu/goat/factsheet/breeds.htm](http://www.ansc.purdue.edu/goat/factsheet/breeds.htm)

Breed of Livestock [http://www.ansi.okstate.edu/breeds/cattle/](http://www.ansi.okstate.edu/breeds/cattle/)

Have students get in groups of two or three and have them research a specific dairy breed (cattle or goat). Have each group do a presentation for the class including the following information:

• Dairy operations in Kentucky that have that specific breed (goats dairies will be harder to identify).
• The type of milking operation (pipeline, hand, surge bucket milkers, etc.). Students may need to call the producer to get this information. Equipment can be found for viewing by checking with dairy supply companies online.
• Milk fat content of product produced.
• Milk production per pounds per year.
• Lactation period.
• Distinctive markings or qualities.
• Pictures.

Alternative activity - Have students work in groups to find and map Kentucky dairy farms and processors. Processors and manufacturing plants can be found at the Kentucky Department of Agriculture: Dairy Resources [http://www.kyagr.com/marketing/animalmktg/DairyResources.htm](http://www.kyagr.com/marketing/animalmktg/DairyResources.htm)
Activity 3

Use handout 6-1 Types of Milk.

Milk provides us with the best source of calcium. There are different types of milk. List on the board the different kinds of milk and have students identify how they are different.

Activity 4

Use activity sheet 6-2 Dairy: Nutritional content.

Now that the different types of milk and dairy products have been identified, have students complete the Dairy: Nutritional Content Worksheet activity sheet 6-2 (results may vary.)

Resources:

Many Milks FN-AP.004
Nutrients in Milk http://www.dairycouncilofca.org/Milk-Dairy/Nutrients-in-Milk.aspx
The Essentials of Dairy Nutrition http://www.nationaldairycouncil.org/Pages/Home.aspx
The Dairy Connection http://mil克facts.info/Nutrition%20Facts/Nutrient%20Content.htm
Nutritional Information http://www.usdec.org/Products/content.cfm?ItemNumber=82658

Activity 5

Use handout 6-2 – It's All About the Cheese, activity sheet 6-3 – Cheesy Terms, and activity sheet 6-4 – Different Categories of Cheese.

A highly concentrated form of milk that provides us with a lot of nutrients is cheese. Natural cheese begins with milk, usually from cows, goats, sheep or cream. Cheese is high in nutritional content including protein, calcium, riboflavin, vitamin A, magnesium, phosphorus, and iron. There are different categories and many different varieties of cheese. Categories are determined by texture or consistency and the degree or kind of ripening. Varieties are determined by:

• Type of milk used
• Quantity of salt, colors, and other seasonings
• Bacteria and mold used
• Environmental conditions during ripening (temperature, humidity, and time)
• Processing methods

Unripened cheese – has high moisture content and is eaten fresh within a few weeks. The curd is soft and fragile because it has been coagulated primarily by acid.

Ripened cheese – has low moisture content and is ripened for three months to two years before it is eaten in order to develop its flavor and texture. It is coagulated by the action of an enzyme (such as rennin). The action of enzymes, bacteria, molds,
or yeast hydrolyze the casein curds to amino acids and ammonia, the fat to fatty acids and acetate, and the lactose to lactic acid.

Have students complete the Cheesy Terms activity sheet 6-3 and complete the Different Categories of Cheese activity sheet 6-4. Students can use the Internet for research or use handout 6-2 It’s All About the Cheese to find answers.

Activity 6

(Activity 6)

The numbers of dairy farms have decreased over time in Kentucky. Do you know a dairy farmer in the area?

Kentucky still has dairy farming operations, it’s just a matter of finding them.

Have the students research Kentucky dairy farms, dairy processors, and distributors. Have the students provide as much information as possible and present to the school food service director. Students can also design and present dairy poster boards or brochures in the school cafeteria. This would be a good way to encourage Kentucky dairy products for school meals. Processors and manufacturing plants are listed on the Kentucky Department of Agriculture Dairy Resources http://www.kyagr.com/marketing/animalmktg/DairyResources.htm.

Activity 7

(Activity 7)

This activity is continued through each lesson) Art activity – Have students create their own portion size kits to help them estimate their servings of dairy, following directions in activity sheet 1-3 of the introductory unit. Parts of the kit relevant to the dairy group include 1 inch cube cheese, 8 ounces or 1 cup of milk. (This activity is offered for each lesson so the entire portion size kit is created by the end of the curriculum)

Additional Activities

• Use Ice Cream in a Bag handout 6-3. Students could work in teams. One counter for the number of shakes and one timer for the number of minutes/shakes it takes to make ice cream.

• Take a field trip to a Kentucky dairy or processor, activity sheet 6-5.

• Research what things can affect milk production in cattle (grass fed, grain fed, hormones, time schedules, etc.).

• Have a taste testing with UHT, evaporated, goat, skim, 1%, 2% and/or whole milks. Conduct this taste test during lunch hours and have other students make choices. Report the results back to the school student body, using graphs, charts, and other visuals. This information can also be presented to the school food service director along with contact information for local milk processors.

• Do a label comparison on cheese products.

• Have a taste test with different cheeses-soft, hard, and processed. Conduct this taste test during lunch hours and have other students make choices. Report the results back to the school student body, using graphs, charts, and other visuals. This information can also be presented to the school food service director along with contact information for local cheese makers.

• Have students research or discuss alternatives for lactose-intolerant individuals (soy, almond?).
• Have students find a dairy farmer blog and report back to the class once a week on what is going on at the dairy farm. Encourage students to think of goats as well as cattle. Students should search for dairy blogs online. Various available dairy blogs are listed below (some of these are not in Kentucky).
  • Dairy Goddess Blog
  • Stoney Field Farm Blog
  • Northview Farm Blog
  • New Milkers Blog

• Rent “Kentucky Kate Milk Cow” from Kentucky Department of Agriculture. Contact Eunice Schlappi with the marketing department at 502-564-4983 or http://www.kyagr.com/marketing/animalmktg/KYKate.htm

Additional Resources:

Kentucky Department of Agriculture Dairy Resources http://www.kyagr.com/marketing/animalmktg/DairyResources.htm

Common Breeds of Dairy Goats http://www.ansc.purdue.edu/goat/factsheet/breeds.htm

Breeds of Livestock http://www.ansi.okstate.edu/breeds/cattle/

Kentucky Department of Agriculture: Agricultural Links http://www.kyagr.com/forms/aglinks.htm

Essentials of Dairy Nutrition http://www.nationaldairycouncil.org/Pages/Home.aspx?gclid=C1I6yYuRrKsCFcFM2godfGUh6g

Kentucky Kate http://www.kyagr.com/marketing/animalmktg/KYKate.htm
# Kentucky Core Academic Standards

## Reading

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10</td>
<td>RI.9-10.1</td>
<td>Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</td>
</tr>
</tbody>
</table>

## Reading Science & other Technical

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10</td>
<td>RST.9-10.1</td>
<td>Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</td>
</tr>
<tr>
<td></td>
<td>RST.9-10.2</td>
<td>Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</td>
</tr>
<tr>
<td></td>
<td>RST.9-10.3</td>
<td>Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</td>
</tr>
<tr>
<td></td>
<td>RST.9-10.4</td>
<td>Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.</td>
</tr>
<tr>
<td></td>
<td>RST.9-10.5</td>
<td>Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).</td>
</tr>
<tr>
<td></td>
<td>RST.9-10.6</td>
<td>Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.</td>
</tr>
<tr>
<td></td>
<td>RST.9-10.9</td>
<td>Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.</td>
</tr>
</tbody>
</table>

## Writing

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10</td>
<td>W.9-10.7</td>
<td>Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td></td>
<td>W.9-10.8</td>
<td>Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</td>
</tr>
</tbody>
</table>

## Writing Science & other Technical

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10</td>
<td>WHST.9-10.7</td>
<td>Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td></td>
<td>WHST.9-10.8</td>
<td>Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</td>
</tr>
<tr>
<td></td>
<td>WHST.9-10.9</td>
<td>Draw evidence from informational texts to support analysis, reflection, and research.</td>
</tr>
</tbody>
</table>
**Speaking & Listening**

SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed. Propel conversations byposing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.

SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

SL.9-10.5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

SL.9-10.6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.
# Kentucky Farm 2 School
## Grades 11-12: Lesson 6
### Not Just Milk Alone!

<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Informational</strong></td>
</tr>
<tr>
<td>RI.11-12.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.</td>
</tr>
<tr>
<td>RI.11-12.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).</td>
</tr>
<tr>
<td>RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</td>
</tr>
<tr>
<td><strong>Reading Science &amp; other Technical</strong></td>
</tr>
<tr>
<td>RST.11-12.1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</td>
</tr>
<tr>
<td>RST.11-12.2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</td>
</tr>
<tr>
<td>RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</td>
</tr>
<tr>
<td>RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</td>
</tr>
<tr>
<td>RST.11-12.5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</td>
</tr>
<tr>
<td>RST.11-12.6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</td>
</tr>
<tr>
<td>RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</td>
</tr>
<tr>
<td>RST.11-12.8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</td>
</tr>
<tr>
<td>RST.11-12.9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</td>
</tr>
</tbody>
</table>
| Writing | W.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
W.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |
| Writing Science & other Technical | WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.  
WHST.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.  
WHST.11-12.9. Draw evidence from informational texts to support analysis, reflection, and research. |
### Speaking & Listening

SL.11-12.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.
Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.
Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.
Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.
SL.11-12.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.
SL.11-12.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
SL.11-12.5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
SL.11-12.6. Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.
MILK GROUP
Get Your Calcium-Rich Foods!

Foods in the Milk Group include milk, yogurt, and cheese. These foods are best known for their high calcium content. Foods in the Milk Group are good sources of:

▲ Calcium
▲ Protein
▲ Vitamin D
▲ Vitamin A

They may also be sources of fat, saturated fat, and added sugars. It is important to choose foods from the Milk Group that are low in fat or fat-free and have no added sugar. Avoid foods from the Milk Group that are high in calories.

Most people do not consume enough foods from the Milk Group. MyPyramid shows that the number of calories eaten from low-fat and fat-free dairy products should be about the same as the number eaten from the Vegetable Group. Most adults need 3 cups of milk daily, while children 8 years old and younger need 2 cups every day. If drinking milk causes you problems, choose lactose-free products or other calcium sources, such as dark green vegetables, canned fish with bones, and fortified foods and beverages.

Serving It Up
1 serving of food from the Milk Group is:
• 1 cup of milk
• 1 cup of yogurt
• 1½ ounces of natural cheese
• 2 ounces of process cheese
• 4 tablespoons of Parmesan cheese

A thumb is about the size of 1 ounce of cheese.

A fist is about the size of 1 cup of milk.

What’s the Big Deal?
Calcium makes and keeps bones and teeth strong. If children don’t get enough calcium, their bones may not develop
properly and will not be as strong as they should be. The human body loses calcium every day. To stay healthy, people must eat calcium-rich foods every day. If adults do not get enough calcium to replace losses, their bones can become brittle and break more easily.

Calcium also helps blood to clot. Without it, people would be unable to heal. It helps muscles to move. Without calcium, there would be no heartbeat. That’s a big deal!

A Special Note about Infants

Infants get calcium from breast milk or iron-fortified formula. After they are 12 months old, infants can get calcium from purchased milk or other milk products.

Do not give skim or low-fat milk to infants or children under 2 years of age except under advice of a physician.

### How Much Calcium Is in It?

<table>
<thead>
<tr>
<th>Food</th>
<th>Calcium Content (milligrams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cup milk</td>
<td>290</td>
</tr>
<tr>
<td>1 cup yogurt</td>
<td>300</td>
</tr>
<tr>
<td>1 ounce cheese</td>
<td>200</td>
</tr>
<tr>
<td>1 ounce process cheese food</td>
<td>160</td>
</tr>
<tr>
<td>1 ounce process American cheese</td>
<td>125</td>
</tr>
<tr>
<td>½ cup cottage cheese</td>
<td>125</td>
</tr>
<tr>
<td>½ cup custard</td>
<td>250</td>
</tr>
<tr>
<td>½ cup pudding (made with milk)</td>
<td>150</td>
</tr>
<tr>
<td>½ cup ice cream</td>
<td>90</td>
</tr>
<tr>
<td>1 tablespoon Parmesan cheese</td>
<td>70</td>
</tr>
</tbody>
</table>

How much of each of the above foods would provide about the same amount of calcium as 1 cup of milk?
You can increase your calcium intake in many ways:

1. Cook with milk and cheese. Add milk instead of water to soups, casseroles, breads, hot cereals, and desserts. Use either fresh fluid milk or reconstituted nonfat dry milk – milk powder you have mixed with water. Adding nonfat dry milk powder adds calcium to meats, vegetables, cereals, and other foods.
   - **Ground meats, fish, or chicken:** Add ½ to ¾ cup nonfat dry milk for each pound of ground meat. Mix with meat, fluid, or crumbs.
   - **Cooked cereals:** Mix an equal amount of nonfat dry milk and cereal before cooking, then cook following directions on the package.
   - **Mashed vegetables:** Add ½ cup nonfat dry milk for each 2 cups of mashed vegetables, such as potatoes, squash, sweet potatoes, and turnips.
   - **Sauces, gravies, soups, puddings, and custards:** Add 4 tablespoons nonfat dry milk for each cup of water or broth in the recipe.

2. Include milk as a beverage in family meals.
   - **Scrambled eggs:** Add 1 tablespoon nonfat dry milk and 1 tablespoon water for each egg.
   - **Baked goods:** Fortify biscuits, breads, rolls, cakes, cookies, and pancake batter by adding ½ cup nonfat dry milk for each cup of water in the recipe.

Add shredded cheese to meat loaf, salads, sandwich fillings, or other favorite foods. Sprinkle cheese over fruit or add it to milk sauce and serve over vegetables or meat.
• Make hot chocolate with milk. Make homemade milk shakes by adding ice milk, mashed berries, or bananas to milk and mixing well.

3. Include cooked or raw, dark leafy greens in family meals.
• Serve collards, turnip greens, and kale as vegetables or in salads. Add small pieces of mackerel or sardines to green salads for extra calcium.

• For snacks, try plain yogurt with fresh fruit, frozen yogurt on a stick, cheese chunks, string cheese, milk beverages, or raw broccoli served with a cottage cheese and yogurt dip.
• For dessert, serve custard, milk pudding, or an ice milk sundae topped with fresh, canned, or frozen fruits.

**Calcium-Rich Recipes**

Make the following recipe for cream soup mix. Use it as a base for cheese soup or any cream soup, such as cream of potato, cream of chicken, or cream of broccoli. Substitute the cream soup mix for one undiluted 12-ounce can of condensed cream soup by mixing 1¼ cups of water with 1 cup of soup mix.

**Cream Soup Mix**

2 cups nonfat dry milk  
¼ cup chicken bouillon powder  
¾ cup cornstarch  
1 teaspoon dried basil (optional)  
2 tablespoons dried minced onion flakes  
¼ teaspoon dried thyme (optional)  
½ teaspoon ground black pepper

1. Combine nonfat dry milk, cornstarch, onion flakes, pepper, and chicken bouillon. If desired, add basil and thyme. Mix well and place in an airtight container. Store in a cool, dry place away from strong odors.

2. When using the mix, combine ⅔ cup of mix with 1¼ cups of water in a saucepan. Cook and stir until thickened.

3. For variations, melt cheese into the soup, or add cooked broccoli, cauliflower, potatoes, other vegetables, or chicken.

**Yield:** 3 cups soup mix

**Per serving:** 125 calories; 0 g fat; 3 mg cholesterol; 1660 mg sodium

**Calcium:** 1 serving equals 1 cup milk

**Note:** To lower sodium content, substitute low-sodium chicken bouillon or reduce or omit chicken bouillon powder

Recipe provided by <www.allrecipes.com>
Yogurt-Fruit Smoothie

Makes 2 servings

¼ cup strawberry yogurt
½ cup nonfat dry milk
½ banana
¾ cup orange juice, chilled
½ cup strawberries (optional)

1. Put ingredients into a blender or food processor and blend until smooth.

Yield: 2 servings
Per serving: 150 calories; 0 g fat; 2 mg cholesterol; 100 mg sodium
Calcium: 1 serving equals 1¼ cups milk.
Note: For variety, try using various juices and frozen fruits in combination with different flavors of yogurt.

Recipe provided by Washington State Dairy Council

Written by Kathy Daly-Koziel, former EFNEP Coordinator

Revised by Jackie Walters, MBA, RD, LD, Extension Associate for Nutrition Education Programs
Dairy Operations

General dairy breeds are:

**Cattle**
- Holstein
- Jersey
- Brown Swiss
- Guernsey
- Ayrshire
- Milking shorthorn

**Goats**
- Nubian
- LaMancha
- Saanen
- Toggenburg
- Oberhasli
- Nigeran dwarf
- Sable
- Alpine

Helpful websites:

Common breeds of dairy goats in the US
[http://www.ansc.purdue.edu/goat/factsheet/breeds.htm](http://www.ansc.purdue.edu/goat/factsheet/breeds.htm)

Breeds of Livestock
[http://www Ansi.Okstate.edu/breeds/cattle/](http://www Ansi.Okstate.edu/breeds/cattle/)

Divide into groups of two or three. Each group is to research a specific dairy breed (cattle or goat). Each group will present to the class including the following information:

- Dairy operations in Kentucky that have that specific breed (goats dairies will be harder to identify).
- The type of milking operation (pipeline, hand, surge bucket milkers, etc.). Students may need to call the producer to get this information. Equipment can be found for viewing by checking with dairy supply companies online.
- Milk fat content of product produced.
- Milk production per pounds per year.
- Lactation period.
- Distinctive markings or qualities.
- Pictures.

## Types of Milk

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasteurized milk</td>
<td>Heated to a high temperature then quick cooled to destroy microorganisms that cause diseases and spoilage. This gives milk a longer shelf life and eliminates the possibility of disease.</td>
</tr>
<tr>
<td>Homogenized milk</td>
<td>Has undergone a specific process known as “homogenization” to break up the fat globules that form a creamy layer at the top of the milk. Homogenization spreads the fat evenly throughout the milk.</td>
</tr>
<tr>
<td>Whole milk</td>
<td>Contains 3.3% milk fat.</td>
</tr>
<tr>
<td>2% milk</td>
<td>98% of the milk fat is removed.</td>
</tr>
<tr>
<td>1% milk</td>
<td>99% of the milk fat is removed.</td>
</tr>
<tr>
<td>Skim milk</td>
<td>Contain less than ½ % milk fat.</td>
</tr>
<tr>
<td>Nonfat dry milk</td>
<td>Made from fresh raw whole milk. The water and fat have been removed. After nonfat dry milk powder is dissolved in water, it has the same nutritional value as fresh skim milk.</td>
</tr>
<tr>
<td>Evaporated milk</td>
<td>Fresh whole milk concentrated by removing about 50% of the water.</td>
</tr>
<tr>
<td><strong>Buttermilk</strong></td>
<td>Fermented skim or low fat milk. It is a cultured milk product giving it a slightly thickened texture and tangy flavor. Some buttermilk has flakes of butter added.</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Sweetened condensed milk</strong></td>
<td>Fresh whole milk that has had approximately 50% of the water removed and sugar added.</td>
</tr>
<tr>
<td><strong>Goats milk</strong></td>
<td>Milk from a goat that is a white, opaque liquid with a slightly sweet taste and no odor. It has a higher fat content and slightly higher calcium content than cow’s milk.</td>
</tr>
<tr>
<td><strong>UHT (ultra high temperature) milk</strong></td>
<td>Milk quickly heated to about 300°F then vacuumed packed. This allows the milk to be stored without refrigeration for an average of six months.</td>
</tr>
<tr>
<td><strong>Cream</strong></td>
<td>The butterfat-rich part that naturally rises to the top of non-homogenized cow’s milk. Heavy cream has between 30% and 40% butterfat. Light creams average around 20% butterfat.</td>
</tr>
<tr>
<td><strong>Half and half</strong></td>
<td>Equal parts of whole milk and cream. Half is cream and half is milk.</td>
</tr>
<tr>
<td>Milk Product</td>
<td>Calories</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Whole homogenized milk</td>
<td></td>
</tr>
<tr>
<td>1% milk</td>
<td></td>
</tr>
<tr>
<td>2% milk</td>
<td></td>
</tr>
<tr>
<td>Chocolate fat-free milk</td>
<td></td>
</tr>
<tr>
<td>Fat-free skim milk</td>
<td></td>
</tr>
<tr>
<td>Fat-free dry milk (NFDM)</td>
<td></td>
</tr>
<tr>
<td>Reconstituted evaporated milk</td>
<td></td>
</tr>
<tr>
<td>Fat-free Buttermilk</td>
<td></td>
</tr>
<tr>
<td>Sweetened condensed milk</td>
<td></td>
</tr>
<tr>
<td>Goat's milk</td>
<td></td>
</tr>
<tr>
<td>Ultra high temperature milk</td>
<td></td>
</tr>
<tr>
<td>Half and half</td>
<td></td>
</tr>
<tr>
<td>Light cream</td>
<td></td>
</tr>
<tr>
<td>Heavy cream</td>
<td></td>
</tr>
<tr>
<td>Types of Milk Products</td>
<td>Calories per 1 Cup</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Whole homogenized milk</td>
<td>150</td>
</tr>
<tr>
<td>1% milk</td>
<td>110</td>
</tr>
<tr>
<td>2% milk</td>
<td>130</td>
</tr>
<tr>
<td>Chocolate fat-free milk</td>
<td>140</td>
</tr>
<tr>
<td>Fat-free skim milk</td>
<td>90</td>
</tr>
<tr>
<td>nonfat dry milk (NFDM)</td>
<td>434</td>
</tr>
<tr>
<td>Reconstituted evaporated milk</td>
<td>200</td>
</tr>
<tr>
<td>Fat-free Buttermilk</td>
<td>90</td>
</tr>
<tr>
<td>Sweetened condensed milk</td>
<td>982</td>
</tr>
<tr>
<td>Goats milk</td>
<td>244</td>
</tr>
<tr>
<td>Ultra high temperature milk</td>
<td>100</td>
</tr>
<tr>
<td>Half and half</td>
<td>315</td>
</tr>
<tr>
<td>Light cream</td>
<td>468</td>
</tr>
<tr>
<td>Heavy cream</td>
<td>414</td>
</tr>
</tbody>
</table>
It’s All About the Cheese

A highly concentrated form of milk that provides us with a lot of nutrients is **cheese**. Natural cheese begins with milk, usually from cows, goats, or sheep. Cheese is high in nutritional content including protein, calcium, riboflavin, vitamin A, magnesium, phosphorus, and iron. There are different categories and many different varieties of cheese. **Categories** are determined by texture or consistency and the degree or kind of ripening. **Varieties** are determined by:

- Type of milk used
- Quantity of salt, colors, and other seasonings
- Bacteria and mold used
- Environmental conditions during ripening (temperature, humidity, and time)
- Processing methods

**Unripened cheese** – has high moisture content and is eaten fresh within a few weeks. The curd is soft and fragile because it has been coagulated primarily by acid.

**Ripened cheese** – has low moisture content and is ripened for three months to two years before it is eaten in order to develop its flavor and texture. It is coagulated by the action of an enzyme (such as rennin). The action of enzymes, bacteria, molds, or yeast hydrolyze the casein curds to amino acids and ammonia, the fat to fatty acids and acetate, and the lactose to lactic acid.

Important cheese terms to know:

- **Rennet** - an enzyme that is added to help milk coagulate to form curds
- **Emulsify** - Emulsify means combining of two liquids that normally don't mix easily. The liquids are combined very slowly, usually drop by drop, while beating vigorously, which suspends drops of liquid throughout each other
- **Coagulate** – to change or be changed from a liquid into a thickened mass
- **Vat** – tub where the curd is formed and cut or broken
- **Whey** - the watery part of milk that is separated from the curd in the process of making cheese
- **Curds** – the part of milk that coagulates when the milk sours or is treated with enzymes. Curd is used to make cheese
- **Ripened cheese** – cheese that has ripened for three months to two years before it is eaten in order to develop its flavor and texture
- **Unripened cheese** – cheese that has a high moisture content and is eaten fresh within a few weeks

Different categories of cheese are determined by texture or consistency and the degree or kind of ripening. Six different categories of cheese will be discussed in this lesson.

- Soft-fresh cheese
- Soft-ripened cheese
- Semi-soft cheese
- Semi-hard cheese
- Hard cheese
- Processed cheese
Soft-fresh cheeses are often called acid-set cheeses, because the milk is usually coagulated with lactic acid instead of rennet and enzymes. Whey is drained from soft cheeses under gravity rather than mechanical pressure. Most soft-fresh cheeses are packaged—usually in tubs—without being cut, pressed into a form, or aged. Examples of soft-fresh cheeses:
- Cottage cheese
- Cream cheese
- Feta
- Neufchâtel
- Mascarpone
- Queso Blanco
- Ricotta

Soft-ripened cheeses are almost the same as soft-fresh cheese. The distinctive step in the manufacturing of soft-ripened cheeses that makes it different is the use of a beneficial mold. The mold allows the cheese to ripen from the outside in. Examples of soft-ripened cheeses:
- Brie
- Camembert

Semi-soft cheeses come in two different types: washed-rind and dry-rind. The washed-rind cheeses are surface-treated with special bacteria and then washed with a solution to encourage the growth of the bacteria smear. Washed-rind cheeses ripen from the outside in. Dry-rind cheeses are cured without a surface treatment. Examples of semi-soft cheeses:
- Brick
- Havarti
- Monterey jack
- Limburger
- Muenster
- Pepper jack

Semi-hard cheeses are made by heating raw milk, starter cultures and enzymes to create a semisolid mass, which is then cut, stirred, heated, and the whey drained. Examples of semi-hard cheeses:
- Cheddar
- Colby
- Swiss

Hard cheeses are made by cutting the formed curd into small particles—the size of wheat kernels. The cut curd is then heated to a higher temperature than other cheeses, and the curd settles to the bottom of the vat. The pressed curd is salted in a brine solution or dry-salted, perforated with needles and dry-cured. As the cheese cures, it is periodically turned, scraped, and rubbed with vegetable oil. Examples of hard cheeses:
- Monterey Jack
- Parmesan
- Romano
- Asiago
- Pepato

Processed cheeses are pasteurized and made by mixing and heating natural cheeses. The cooking temperature depends on whether the end product is processed cheese, processed cheese food, or processed cheese spread. Examples of processed cheeses:
- Velveeta
- American
- Cheese Whiz
Cheesy Terms

• Whey -

• Rennin -

• Curds –

• Ripened cheese –

• Unripened cheese –

• Coagulate -

• Vat -

• Emulsify –

Cheesy Terms Key

**Whey** - the watery part of milk that is separated from the curd in the process of making cheese

**Rennin** - an enzyme that coagulates milk and is used in making cheese

**Curds** – the part of milk that coagulates when the milk sours or is treated with enzymes. Curd is used to make cheese

**Ripened cheese** – cheese that has ripened for three months to two years before it is eaten in order to develop its flavor and texture

**Unripened cheese** – cheese that has a high moisture content and is eaten fresh within a few weeks

**Coagulate** – to change or be changed from a liquid into a thickened mass

**Vat** – tub where the curd is formed and cut or broken

**Emulsify** – combining of two liquids that normally don’t mix easily. The liquids are combined very slowly, usually drop by drop, while beating vigorously, which suspends drops of liquid throughout each other

# Categories of Cheese

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Variety of Cheese</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft-Fresh Cheese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft-Ripened Cheese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-Soft Cheese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-Hard Cheese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Hard Cheese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processed Cheese</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
# Categories of Cheese Key

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Variety of Cheese</th>
</tr>
</thead>
</table>
| **Soft-Fresh Cheese** | Soft-fresh cheeses are often called acid-set cheeses, since the milk is usually coagulated with lactic acid instead of rennet and enzymes. Whey is drained from soft cheeses under gravity rather than mechanical pressure. Most soft-fresh cheeses are packaged—usually in tubs—without being cut, pressed into a form or aged. | • Cottage cheese  
• Cream cheese  
• Feta (Plain & Flavored)  
• Neufchâtel  
• Mascarpone  
• Queso blanco  
• Ricotta |
| **Soft-Ripened Cheese** | The distinctive step in the manufacture of soft-ripened cheeses is the use of a beneficial mold. The mold allows the cheese to ripen from the outside in.                                                       | • Brie  
• Camembert |
| **Semi-Soft Cheese** | There are two types of semi-soft cheeses: washed-rind and dry-rind. The washed-rind cheeses are surface-treated with special bacteria and then washed with a solution to encourage the growth of the bacteria smear. Washed-rind cheeses ripen from the outside in. Dry-rind cheeses are cured without a surface treatment. | • Brick (Surface Ripened)  
• Havarti (Plain & Flavored)  
• Monterey jack  
• Limburger  
• Muenster  
• Pepper Jack |
| **Semi-Hard Cheese** | Raw milk, starter cultures and enzymes are heated to create a semisolid mass, which is then cut, stirred, heated and the whey drained.                                                                                           | • Cheddar  
• Colby  
• Swiss |
Following formation of the curd, it is cut into small particles—the size of wheat kernels. The cut curd is then heated to a higher temperature than other cheeses, and the curd settles to the bottom of the vat. The pressed curd is salted in a brine solution or dry-salted, perforated with needles and dry-cured. As the cheese cures it is periodically turned, scraped and rubbed with vegetable oil.

- Monterey Dry Jack
- Parmesan
- Romano
- Asiago
- Pepato

Pasteurized processed cheese is made by mixing and heating natural cheeses. The cooking temperature depends on whether the end product is processed cheese, processed cheese food or processed cheese spread.

- Velveeta
- American
- Cheese Whiz

Ice Cream in a Bag

**Ingredients:**
- 2 tablespoons sugar
- 1 teaspoon vanilla
- 8 oz milk (whole, 2%, 1%, or skim) the lower the fat content the longer the shaking time
- 1 pint freezer bag (must seal well)
- Shaker containers - Approximately 3 quarts in size*
- 4 cups of ice to start *(It will take about one 7-lb bag of ice for every six students)*
- ¼ cup rock salt

Put sugar, vanilla, and milk in the 1 pint freezer bag. Remove as much air as possible and seal the freezer bag. Double bagging is suggested. In the shaker container put 4 cups of ice and ¼ cup of salt. Set the resealable bag inside the shaker container. Make sure the container is sealed tightly. Gently shake for up to 10 minutes. Check after five minutes to see how well the ice cream is freezing. When the ice cream is frozen, wipe off the top of the bag before opening to remove the salt. Open and enjoy.

Make it more interesting by trying different types of milk and different fat content. Record the number of shakes and the number of minutes it takes to make the ice cream and then compare.

* Rubbermaid containers with tight-fitting lids were used when testing this recipe

More information on why salt melts the ice can be found at [www.howstuffworks.com/question58.htm](http://www.howstuffworks.com/question58.htm).
### Nutrition Facts

#### 2 % Milk

<table>
<thead>
<tr>
<th>Serving Size (256g)</th>
<th>Calories from Fat 40</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calories</strong> 240</td>
<td><strong>% Daily Value</strong> 7%</td>
</tr>
<tr>
<td>Total Fat 4.5g</td>
<td>Saturated Fat 3g 15%</td>
</tr>
<tr>
<td>Trans Fat 0g</td>
<td>Calcium 35%</td>
</tr>
<tr>
<td>Cholesterol 20mg</td>
<td>Sodium 135mg</td>
</tr>
<tr>
<td>Total Carbohydrate 38g</td>
<td>Dietary Fiber 0g 0%</td>
</tr>
<tr>
<td>Sugars 38g</td>
<td>Protein 9g</td>
</tr>
<tr>
<td>Vitamin A 8%</td>
<td>Vitamin C 4%</td>
</tr>
</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.*

<table>
<thead>
<tr>
<th>Calories per gram:</th>
<th>Fat 9</th>
<th>Carbohydrate 4</th>
<th>Protein 4</th>
</tr>
</thead>
</table>

#### Non-fat Milk

<table>
<thead>
<tr>
<th>Serving Size (256g)</th>
<th>Calories from Fat 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calories</strong> 190</td>
<td><strong>% Daily Value</strong> 0%</td>
</tr>
<tr>
<td>Total Fat 0g</td>
<td>Saturated Fat 0g 0%</td>
</tr>
<tr>
<td>Trans Fat 0g</td>
<td>Calcium 45%</td>
</tr>
<tr>
<td>Cholesterol 5mg</td>
<td>Sodium 120mg</td>
</tr>
<tr>
<td>Total Carbohydrate 37g</td>
<td>Dietary Fiber 0g 0%</td>
</tr>
<tr>
<td>Sugars 37g</td>
<td>Protein 8g</td>
</tr>
<tr>
<td>Vitamin A 20%</td>
<td>Vitamin C 4%</td>
</tr>
</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.*

<table>
<thead>
<tr>
<th>Calories per gram:</th>
<th>Fat 9</th>
<th>Carbohydrate 4</th>
<th>Protein 4</th>
</tr>
</thead>
</table>

#### Low fat Buttermilk

<table>
<thead>
<tr>
<th>Serving Size (256g)</th>
<th>Calories from Fat 20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calories</strong> 200</td>
<td><strong>% Daily Value</strong> 3%</td>
</tr>
<tr>
<td>Total Fat 2g</td>
<td>Saturated Fat 1g 5%</td>
</tr>
<tr>
<td>Trans Fat 0g</td>
<td>Calcium 25%</td>
</tr>
<tr>
<td>Cholesterol 10mg</td>
<td>Sodium 240mg</td>
</tr>
<tr>
<td>Total Carbohydrate 37g</td>
<td>Dietary Fiber 0g 0%</td>
</tr>
<tr>
<td>Sugars 37g</td>
<td>Protein 8g</td>
</tr>
<tr>
<td>Vitamin A 2%</td>
<td>Vitamin C 4%</td>
</tr>
</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.*

<table>
<thead>
<tr>
<th>Calories per gram:</th>
<th>Fat 9</th>
<th>Carbohydrate 4</th>
<th>Protein 4</th>
</tr>
</thead>
</table>
Dairy Field Trip Review Guide

Student’s name ________________________________________________________________

Farm Name _________________________________________________________________

Farmer’s Name ______________________________________________________________

Location _________________________________________________________________

1. What breed of cattle/goat does the dairy farm have? ____________________________

2. How many cows/goats are in the herd? _________________________________

3. Are the cows/goats grain fed or grass fed? ________________________________
   a. If grain fed, what type of grain? ________________________________________
   b. If grass fed, what type of grass? _______________________________________

4. Are hormones used to increase production? If yes, what kind? _________________

5. How long does the farmer keep cows/goats in the herd? _____________________

6. What kind of dairy operation does the farmer have? _________________________

7. How often do the cows/goats get milked? _________________________________

8. How is the milk transported to the processing plant? _______________________

9. Where is the processing plant located? _________________________________

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Many Milks

Around the world you’ll find people drinking dairy milk from a variety of sources including camels, water buffalo and sheep. Gone are the days in American grocery stores when cow’s milk was the only kind found. Today, American consumers can find a variety of milks including those from animals, nuts, beans and grains. They are located on general grocery shelves, in coolers and in the natural foods section.

Are all milks and non-dairy beverages nutritionally equal? Can they be interchanged in recipes with the same success? Why might one choose an alternate to cow’s milk? We'll explore many dairy milks and non-dairy beverages in this publication.

Dairy milk, which comes from animals, is a good, natural source of many vitamins and minerals including calcium. In addition, it is often fortified with vitamins A and D. Non-dairy milks, or non-dairy beverages, may or may not be equal nutritionally to dairy milk. They may or may not be fortified with nutrients to make them nutritionally closer to dairy milk. However, non-dairy beverages are great for those with milk allergies, religious beliefs or lactose intolerance.

Dairy milk and non-dairy beverages may bear the USDA Organic Seal. This seal indicates the product has met strict guidelines. Research has not shown organic milk to be more nutritious than non-organic.(1)

Types of Dairy and Non-Dairy Products

Let’s first look at some products found on the market today.

Cow’s Milk comes in a variety of options from whole (no less than 3.25 percent milk fat), 2%, 1%, non-fat, buttermilk, flavored, dry and a variety of creams. It is a good source of high-quality protein and contains calcium. It is usually fortified with vitamins A and D.

Goat’s Milk is a good source of high-quality protein that is higher in calcium, vitamin B6, potassium and niacin than cow’s milk. It does not contain as much B12 or folate as cow’s milk. The fat globules in goat’s milk tend to be easier to digest because they are not as large as those found in cow’s milk. However, those with lactose intolerance or milk allergy may or may not tolerate goat’s milk any better than cow’s milk. Goat’s milk can be found in full and lower-fat varieties.(2)
Soymilk is made from ground soybeans and filtered water. It may contain sweeteners and flavors. It is often fortified with vitamins and minerals to better compare to cow’s milk.

Rice Milk is typically made from brown rice and filtered water. It may have some oil added. It also may be fortified with vitamins and minerals. It tends to be sweeter than cow’s milk.

Almond Milk is made from ground almonds and filtered water. It typically contains sweeteners and other ingredients. Some of the added ingredients improve the shelf-life. It may be fortified with vitamins and minerals.

Coconut Milk is made with finely grated coconut meat that is steeped in hot water and then filtered. Regular coconut milk is higher in fat and calories than cow’s milk. Note: cream of coconut is not the same as coconut milk.

Hemp Milk is made from shelled hemp seeds and filtered water. Most contain some sweetener. It is usually fortified with vitamins and minerals. Hemp seeds used in milk making are not the variety of hemp from which marijuana is harvested. It tends to have a “grassy” flavor.

Other Seed, Nut and Whole Grain Milks can be made with a variety of seeds, nuts and whole grains. There are many on American grocery shelves including oat and hazelnut milks. In other countries you may find potato milk.

Raw Milk from cows, sheep, goats and other animals has not been pasteurized. It may contain bacteria and viruses that could cause illness in humans. It is illegal in most states to sell raw milk for human consumption. Research has not shown a difference in nutrition between pasteurized and raw milk.

Terms to Know

A variety of terms can be seen on a carton of milk or non-dairy beverage. Below is a brief explanation of some of the more common terms.

Homogenized means the fat globules of pasteurized dairy milk have been broken up so they stay distributed throughout the liquid and don’t rise to the top.

Pasteurized indicates the dairy milk has been heated to a specific temperature for a specific amount of time to kill harmful bacteria and organisms including those that cause typhoid fever, tuberculosis and diphtheria. Louis Pasteur developed the process in 1864.

Lactose is the main carbohydrate or sugar found naturally in dairy milk. Lactose is broken down into glucose and galactose during digestion in the small intestine.
Lactose Intolerance occurs in those individuals who lack enough of the enzyme lactase. Lactase breaks down lactose into smaller, more easily digested sugars. Those with intolerance to lactose may experience symptoms in as little as 15 minutes after consuming foods containing it. However, individuals vary and those with lactose intolerance may be able to eat milk products that contain small amounts of the milk sugar.(8)

Milk Allergy is an allergic reaction to the protein components of dairy milk. Those with a milk allergy must avoid all dairy milk and products containing it.(8)

Casein is a mixture of proteins in dairy milk that is white, tasteless and odorless. It is very nutritious. It can be separated from other dairy milk components with rennin and is the basis for cheese.(9)

Whey is the watery part of dairy milk that forms along with curd when milk coagulates. It is a mixture of lactose, water, minerals, vitamins, some protein and a little fat.(10)

Fortified indicates vitamins and minerals have been added to the milk or non-dairy beverage beyond what would normally be found in the product. Dairy milk and many non-dairy beverages are fortified with vitamins A and D.(5)

Grade A is a dairy milk rating indicating the milk has been produced, stored, handled, processed and transported in a manner conform to strict milk law standards for quality and sanitation.(5) Grade B dairy milk is often used in cheese making.(11)

UHT (Ultra-High Temperature) is a type of pasteurization where raw dairy milk is heated from 280°F to 302°F for at least 2 seconds, followed by rapid cooling to 40°F. This pasteurization process provides for a much longer shelf-life in the refrigerator.(12)

Shelf Stable indicates the item can be safely stored at room temperature or ‘on the shelf.’ These products do not need to be refrigerated until after they are opened.(13) Shelf stable milk and non-dairy beverages are often sold in aseptic packaging.

Aseptic Packaging indicates “the food or beverage is sterilized by quick exposure to ultra-high heat, rapidly cooled to an ambient temperature and filled into sterilized containers that are then sealed in a commercially sterile environment. The aseptic packed is not processed further.”(14)

The Fat Content

Table 1 shows the percent of calories from fat, saturated fat and cholesterol in several dairy and non-dairy beverages. The 2010 Dietary Guidelines for Americans recommend we get no more than 7 to 10 percent of our total calories from saturated fat and consume less than 300 mg of cholesterol each day.(15) For improved overall health one should choose products that are lower in fat, saturated fat, and cholesterol.
Table 1 - Fat, Saturated Fat and Cholesterol in Selected Milk or Non-Dairy Beverages(16, 17)

<table>
<thead>
<tr>
<th>MILK VARIETY (1 cup)</th>
<th>PERCENT of CALORIES FROM TOTAL FAT</th>
<th>PERCENT of CALORIES FROM SATURATED FAT</th>
<th>MILLIGRAMS of CHOLESTEROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole (3.25% milk fat)</td>
<td>48</td>
<td>28</td>
<td>24</td>
</tr>
<tr>
<td>(cow’s)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2% Milk (cow’s)</td>
<td>36</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td>1% Milk (cow’s)</td>
<td>21</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Skim (Low-fat) Milk (cow’s)</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Whole (goat)</td>
<td>54</td>
<td>35</td>
<td>27</td>
</tr>
<tr>
<td>Soy (regular)</td>
<td>44</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Soy (light)</td>
<td>13</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Coconut</td>
<td>97</td>
<td>87</td>
<td>0</td>
</tr>
<tr>
<td>Almond</td>
<td>67</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rice</td>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hemp</td>
<td>22</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Different brands may have slightly different amounts of fat, saturated fat, and cholesterol. The Nutrition Facts panel on the label of the product provides accurate information for the specific brand.

**Figuring the Amount of Fat**

There are approximately nine calories in one gram of fat. To calculate the percentage of total calories from total fat, multiply the grams of total fat by 9 and divide that number by the number of calories per serving. Multiply the answer by 100. The result is the percent of calories from fat.

(grams of total fat per serving in product x 9) ÷ number of calories per serving x 100 = percent of calories from fat

You can also take the Calories from Fat and divide it by Calories, as listed on the Nutrition Facts panel, and multiply the answer by 100 to get the same result. Remember, some figures on food labels have been rounded to the nearest whole or legal number.

**How Much Calcium?**

We often consume dairy milk and milk products because they are good sources of calcium. Recommendations for daily calcium intake for different ages and stages of life are found in Table 2. The amount of calcium in some dairy milk and non-dairy beverages is provided in Table 3. Calcium, along with other nutrients, helps build strong bones and teeth and helps our hearts beat.
Table 2 – Recommended Dietary Allowance (RDA) for Calcium(18)

<table>
<thead>
<tr>
<th>Age</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 years</td>
<td>700 mg</td>
</tr>
<tr>
<td>4-8 years</td>
<td>1,000 mg</td>
</tr>
<tr>
<td>9-18 years</td>
<td>1,300 mg</td>
</tr>
<tr>
<td>19-70 years</td>
<td>1,000 mg</td>
</tr>
<tr>
<td>71+ years</td>
<td>1,200 mg</td>
</tr>
</tbody>
</table>

Table 3 – Calcium Content in Selected Dairy Milk or Non-Dairy Beverage(16)

<table>
<thead>
<tr>
<th>MILK VARIETY</th>
<th>AMOUNT (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole (3.25% milk fat) (cow)</td>
<td>276</td>
</tr>
<tr>
<td>2% Milk (cow)</td>
<td>293</td>
</tr>
<tr>
<td>1% Milk (cow)</td>
<td>305</td>
</tr>
<tr>
<td>Skim Milk (cow)</td>
<td>299</td>
</tr>
<tr>
<td>Whole (goat)</td>
<td>327</td>
</tr>
<tr>
<td>Soy (regular)</td>
<td>301</td>
</tr>
<tr>
<td>Soy (light)</td>
<td>199</td>
</tr>
<tr>
<td>Coconut</td>
<td>41</td>
</tr>
<tr>
<td>Almond</td>
<td>200</td>
</tr>
<tr>
<td>Rice</td>
<td>293</td>
</tr>
<tr>
<td>Hemp</td>
<td>428</td>
</tr>
</tbody>
</table>

Source of Important Nutrients

Dairy milk is a good source of several nutrients our bodies need. How our bodies use these nutrients are outlined below. When choosing a non-dairy beverage it is best to look for one that compares nutritionally to dairy milk. Check the non-dairy beverage label for the word fortified. The other place for information to compare is the Nutrition Facts panel.

**Calcium** is a mineral needed for our heart, muscles and nerves to function properly. It also is needed for blood to clot.(19)

**Protein** is made of amino acids that are used in all parts of the body to build and repair tissue.(8)

**Phosphorus** is a mineral that is a major part of bones and teeth, helps every cell in the body generate energy and is part of DNA and RNA. Almost all foods have some phosphorus. Protein-rich foods like dairy milk contain the most.(8)

**Potassium** is a mineral that helps maintain normal blood pressure, make muscles contract and transmit nerve impulses.(8)

**Vitamin D** helps the body absorb calcium.(20) The amount of vitamin D added to dairy milk is government regulated at a minimum of 400 IU (international units) per quart. Therefore, any fortified dairy milk will have about the same amount of vitamin D. Fortified non-dairy beverages are usually brought to a level similar to their dairy equivalents. Non-dairy milk is fortified with a plant-based source of vitamin D known as D2. Dairy milk is usually fortified with D3, an animal-based source of vitamin D.(21)
**Vitamin B12 (cobalamin)** helps your body use fatty acids and some amino acids. It is a vital part of every cell in the body. It works with folate to make red blood cells. It is found in dairy milk and other animal products. Some foods may be fortified with vitamin B12.(8)

**Riboflavin (vitamin B2)** helps produce energy in all cells of the body.(8) It is destroyed by ultraviolet light, one reason for milk being packaged in cardboard or opaque containers.

---

**Milk for Babies, Infants and Children**

In 2008 the American Association of Pediatrics revised their recommendation for whole milk after weaning. For children without a family history or risk of obesity, heart disease or high cholesterol, whole milk is fine from 12 months to 2 years of age. For those between 12 months and 2 years of age with a family history of obesity, heart disease or high cholesterol the recommendation is to consume reduced-fat or 2% milk.(22)

Cow’s milk is not recommended for children under the age of 12 months because the high protein content is difficult for infants to digest. Other nutrients in cow’s milk also make it unsuitable for infants. The Academy of Nutrition and Dietetics recommends parents consult with their healthcare provider around the child’s first birthday to determine the appropriate time to switch from formula to cow’s milk.(23)

---

**Substituting Dairy Milks and Non-Dairy Beverages**

We use dairy milk for many things. We drink it, pour it over cereals, use it in soups, make custards and puddings and add it to many kinds of recipes. Dairy milk serves many purposes in recipes. In baked goods it enhances crust color, delays staling, adds to the softness of the crust, provides flavor and richness, gives yeast breads a finer crumb and allows custards to firm up properly.(24) We use dairy milk in hot dishes and soups for flavor, creaminess and enhanced nutrition. Because it is generally neutral in flavor, dairy milk can be used in both savory and sweet recipes.

Non-dairy beverages may or may not perform the same way in all recipes. In hot foods, some non-dairy beverages may curdle faster than dairy milk depending on the additives in them.(25) Some of the qualities dairy milk brings to baked goods may or may not be provided by a non-dairy beverage.

Generally, one kind of milk or non-dairy beverage may be substituted 1:1, or cup for cup, in any recipe that calls for cow’s milk. Depending on the liquid used as a substitute, you may have to decrease the sugar, add a little healthy oil or alter the leavening agent.(2)

When choosing a substitute, consider the flavor profile of the product you want to use. Will the flavor affect the finished product? Some products do not get their primary flavor from milk, so you may not notice any difference. Also, think about the role the milk product plays in the final
product. Will the color make a difference? Does the recipe rely on qualities of dairy milk like protein or sugars to produce a desirable end product?

Consider the nutritional profile of the dairy milk or milk alternative. Some alternatives are higher in sugar or fat than regular milk. Others do not provide a good source of calcium or other nutrients for which we usually look to dairy milk.

Some non-dairy beverages have added sweeteners. These additives may make the product unsuitable for savory dishes. When used in sweet dishes you may have to decrease the amount of sugar in the recipe.

**Considerations for Dairy Milk or Non-Dairy Milk Choices**

**Cost** is a consideration as many non-dairy milk options are expensive. Some may cost $12 or more per gallon. In addition, goat’s milk tends to be more expensive than cow’s milk. It may cost $15 or more per gallon.

**Health Issues** are a consideration since non-dairy milk options are great for those with milk allergy or lactose intolerance. Some non-dairy milk options may be good for those looking to decrease their overall fat or saturated fat intake. In addition, some non-dairy milk options contain plant-based phytochemicals which are currently being studied for their overall positive effect on health.

**Fat content** is often a concern since milk from animals naturally contains saturated fat and cholesterol. When choosing dairy milk, it is best to choose milk with the lowest fat content possible for overall heart and general health. Cholesterol is found only in animal products.

**Flavor** is a consideration since the flavor profile of dairy milk or milk alternate should help achieve your goal. Each brand of milk will most likely have a slightly different flavor profile. You may have to try a variety of brands before finding one you like. Flavors in dairy milk are affected by the time of year, the animal food and other factors. Non-dairy milk flavors vary widely by brand and processing methods.

**General Tips**

We have focused on dairy milk and non-dairy beverages in this publication. We all make many choices about our foods every day. In addition, new products are often introduced to the marketplace. Today we have many options for dairy and non-dairy beverages. Our choices for dairy milk and non-dairy beverages can be based on many pieces of information. Each of us has to decide what is most important for our situations. With our own situations in mind the following are some reminders, tips and pointers to consider when selecting dairy or non-dairy beverages.

- Milks from most sources when consumed as beverages are best when cold. Aseptic or shelf-stable boxes can be refrigerated before opening. They must be refrigerated after
opening. Most milk and non-dairy beverages in shelf-stable packages will be good for 5 to 7 days after they are opened.(2)

- Shake non-dairy varieties well before use. Some components of non-dairy beverages settle to the bottom over time.
- Compare the Nutrition Facts panels. Choose the product with the nutrition profile you want. For overall health, when possible, choose the products with less saturated fat and cholesterol.
- Compare calcium content. Many people consume dairy products for the calcium. Not all non-dairy options have been fortified.
- Compare vitamin D content if possible. Vitamin D is used by our bodies to help store calcium. Most, but not all, dairy and non-dairy beverages are fortified to provide at least 25 percent of the daily value needed by the average American.
- Try different flavors of milk from the same company.
- Consider “light” options. You’ll save calories without sacrificing nutrition.
- Consider the price.
- Look at the package size. Choose the size of product you will use without wasting. Or, if you wish to buy a larger package, consider if the contents can be safely frozen for later use.
- Milk should be stored in the coldest part of the refrigerator — in the back on the lowest shelf. This practice will help extend the shelf life. Milk should not be stored in the door of the refrigerator where it is warmer.(26)
- Dairy milk may be frozen. However, once thawed, you may want to use it only for cooking as its texture may change slightly. Shaking or stirring will help to restore it to its more natural texture. It is best to freeze milk in the portions you think you will ultimately use. Divide it into freezer safe containers; leave room for expansion; label and date; and place in the freezer. For small portions you can pour milk into ice cube trays, freeze it, then pop out the cubes and store the cubes in a freezer safe bag or container. Plan to use the frozen milk within a month for best quality.(27) Most non-dairy beverage manufacturers do not recommend freezing their products. Freezing does not affect the nutrition or safety of the product but it will change the texture.(28,29)

References:

LESSON 7

PROTEIN

Dagan Montgomery, 8th grade, Woodford County Middle School

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Facilitator Guide
Lesson 7: Powerful Protein

Lesson Outcomes:

1. Identify the foods included in MyPlate protein group.
   Contributing activities
   • Lesson introduction
   • Handout 7-1
   • Activity 1
   • Activity sheet 7-1
   • Activity 4

2. Know the role of protein in the diet and the nutrients associated with specific products.
   Contributing activities
   • Lesson introduction
   • Handout 7-1
   • Activity 1
   • Activity sheet 7-1

3. Identify the number of USDA recommended servings and serving sizes from the protein group.
   Contributing activities
   • Activity 2
   • Activity sheet 7-2
   • NEP 205
   • NEP 205a
   • FN-SSB.044
   • Handout 7-2
   • Handout 7-3

4. Identify Kentucky-grown and/or produced protein products.
   Contributing activities

5. Identify and locate Kentucky protein producers and processors.
   Contributing activities
   • Activity 2
   • Activity sheet 7-2
   • NEP 205
   • NEP 205a
   • FN-SSB.044
   • Handout 7-2
   • Handout 7-3

Materials and Eqipment

• Handout/overhead 7-1 Protein
• Activity sheet 7-1 Cost/Serving and Nutritional Value of Kentucky Proteins
• Activity sheet 7-2 Group Protein Presentation Requirements
• Activity sheet 7-3 Poultry Questions
• Activity sheet 7-4 Pork Questions
• Activity sheet 7-5 Beef Questions
• NEP 205 – Go Lean With Protein
Lesson Initiation

Bell ringer/class opener:

Write on the board or ask students to list the animals and/or plants that the following protein items come from: bacon, tofu, chuck roast, New York strip, ham, drumstick, mutton, edamame, trout fillet, walnuts, omelet, and pine nuts.

Lesson Introduction

Use Handout 7-1 Protein

One of the MyPlate groups is the protein group. The foods included in the protein group are meats, poultry, seafood, beans, peas, seeds, and nuts.

We all need protein in our diet every day. Meat, poultry, beans, nuts, and fish supply protein, as well as iron and other vitamins and minerals. Protein is the leading component of the body cells, body tissues, and body fluids. Protein performs many functions to keep the body healthy:

- Helps form enzymes, antibodies, and some hormones

Proteins are made up of amino acids. The body needs 20 amino acids to stay healthy. There are 11 non-essential amino acids and nine essential amino acids. Non-essential amino acids are considered non-essential because the body can produce them from chemicals already present in the body, and they do not need to be included in the food we eat. The nine essential amino acids must come from the food we eat. Foods that contain the nine essential amino acids are considered to be complete proteins. Foods that contain some but not all of the nine essential amino acids are considered incomplete proteins.

Activity 1

Use activity sheet 7-1 Cost/Serving and Nutritional Value of Kentucky Protein.

Have students complete cost/serving and Nutritional Values of foods in the protein group by completing activity sheet 7-1 Cost/Serving and Nutritional Value of Kentucky Protein and then graph their results using line graphs, bar graphs, or pie charts. Students will need research time and a chance to visit a grocery store to complete this activity. See examples with activity sheet 7-1 key.

Activity 2

Use activity sheet 7-2 Group Protein Presentation Requirements.

The amount of time available per class will determine the number of class periods this activity will require.
What products do we produce in Kentucky that provide us with complete proteins? Beef, fish, caviar, eggs, poultry, pork, goat, mutton, eggs, cheese, buffalo, tofu, and wild game.

What are some of the products we produce that provide us with incomplete proteins? Peas, beans, walnuts, hazelnuts, hickory nuts, sunflower seeds, and pumpkin seeds.

An interesting question for you: If all of these things are produced in Kentucky why aren’t there more Farm 2 School purchases?

Have students get in groups of two to three depending on the class size. Assign each group to choose one of the complete or incomplete proteins: beef, pork, poultry, goat, lamb/mutton, buffalo, fish/shell fish, wild game, nuts, and beans. Each group should prepare a presentation for the class. Invite the school food service director to view the presentations. The presentation should include:

• Visual representation (PowerPoint®, posters, drawings, photos, graphs, brochure, etc.)
• Breed or variety of protein
• Incomplete or complete protein
• Possible cuts or sections used
• Nutritional information and number of recommended servings and serving sizes according to the USDA Dietary Guidelines
• Where in Kentucky the protein is produced and processed
• Places in Kentucky to purchase item (name and contact information)
• Whether it can be used in the school cafeteria and how it could be used by the food service department
• Preparation techniques
• 1 to 2 healthy recipes (these can be submitted to food service director for use. If that is possible ask the food service director for specific information to address and cost per serving possibilities)

Resources

Go Lean with Protein  NEP 205
How Much is Enough?  NEP 205A
Wild Game: From Field to Table FN-SSB.044
Kentucky USDA Processors Who Slaughter Handout 7-2
USDA Inspected Plants in Kentucky-Handout 7-3
Kentucky Proud http://www.kyproud.com/
Kentucky Market Maker http://ky.marketmaker.uiuc.edu/
Self Nutritional Data http://nutritiondata.self.com/ (nutrition information)
U.S. Poultry and Egg Association http://www.poultryegg.org/
Beef Marketing and Educational Resources http://www.beef.org/
Activity 3

Divide students into two teams. Team 1 will research grass fed livestock and Team 2 will research grain fed livestock. Each team should be prepared to defend their researched feeding choice for the best type of meat available for purchase by consumers.

Activity 4

(This activity is continued through each lesson) Art activity – Have students create their own portion size kits to help them estimate their servings of protein, following directions in activity sheet 1-3 of the introductory unit. Parts of the kit relevant to the Protein group include 3 ounces of meat and ½ cup dried beans. (This activity is offered for each lesson so the entire portion size kit is created by the end of the curriculum.)

Optional activities

• Optional activity to stimulate interest in poultry, beef, and pork. (Script) What is Kentucky’s largest meat production? Poultry. Review other interesting facts with students using the poultry, pork and beef questions Activity sheets 7-3 – Poultry Questions, 7-4 – Pork Questions, and 7-5 – Beef Questions.

• Research Kentucky’s nuts and seeds. Is there a season for nuts and seeds? Do they grow on trees, bushes, or plants in a garden? What types of recipes can nuts and seeds be used in preparing? Does the food service department for your school serve locally produced nuts and seeds? If yes, where in Kentucky do the nuts and seeds come from? If no, is there a place Kentucky nuts and seeds can be purchased for school food service use?

• Take students on a field trip to a local meat farmer, butcher, or meat processing center.

• Have a local farmer, butcher, or meat processor visit as a guest speaker.

• Invite a local chief to prepare protein dishes with and without meat products. Lead a class discussion identifying reasons not to use meat products. Is the non-meat product just as good for you? Did it taste as good as the meat product?

• A taste of tofu:
  • Separate students into groups of three or four then have them research and find recipes that use tofu. Once the group has found a few recipes, have them choose one to prepare. Let the students have “A Taste of Tofu” day by preparing, serving, and tasting dishes containing tofu. Questions for thought: Does Kentucky produce soybeans for the making of tofu? Does Kentucky have a tofu processing plant? Can tofu be made at home?
### Kentucky Core Academic Standards

#### Reading

**Informational**

RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

#### Reading Science & other Technical

RST.9-10.1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

RST.9-10.2. Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

RST.9-10.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

RST.9-10.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

RST.9-10.5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

RST.9-10.6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.

RST.9-10.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

#### Writing

W.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

W.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

#### Writing Science & other Technical

WHST.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

WHST.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

WHST.9-10.9. Draw evidence from informational texts to support analysis, reflection, and research.
| Speaking & Listening | SL.9-10.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively. 
Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.
Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.
SL.9-10.2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.
SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
SL.9-10.5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
SL.9-10.6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. |
## Kentucky Farm 2 School
### Grades 11-12: Lesson 7
#### Powerful Proteins

<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Informational</strong></td>
</tr>
<tr>
<td>RI.11-12.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.</td>
</tr>
<tr>
<td>RI.11-12.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).</td>
</tr>
<tr>
<td>RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</td>
</tr>
<tr>
<td><strong>Reading Science &amp; other Technical</strong></td>
</tr>
<tr>
<td>RST.11-12.1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</td>
</tr>
<tr>
<td>RST.11-12.2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</td>
</tr>
<tr>
<td>RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</td>
</tr>
<tr>
<td>RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a text relevant to grades 11–12 texts and topics.</td>
</tr>
<tr>
<td>RST.11-12.5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</td>
</tr>
<tr>
<td>RST.11-12.6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</td>
</tr>
<tr>
<td>RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</td>
</tr>
<tr>
<td>RST.11-12.8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</td>
</tr>
<tr>
<td>RST.11-12.9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</td>
</tr>
</tbody>
</table>
| Writing | Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
W.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. |

| Writing Science & other Technical | WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
WHST.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
WHST.11-12.9. Draw evidence from informational texts to support analysis, reflection, and research. |
<table>
<thead>
<tr>
<th>Speaking &amp; Listening</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL.11-12.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</td>
</tr>
<tr>
<td>SL.11-12.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.</td>
</tr>
<tr>
<td>SL.11-12.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</td>
</tr>
<tr>
<td>SL.11-12.5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</td>
</tr>
<tr>
<td>SL.11-12.6. Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.</td>
</tr>
</tbody>
</table>
One of the MyPlate groups is the protein group. The foods included in the protein group are meats, poultry, seafood, beans, peas, seeds, and nuts.

We all need protein in our diet every day. Meat, poultry, beans, nuts, and fish supply protein, as well as iron and other vitamins and minerals. Protein is the leading component of body cells, body tissues, and body fluids. Protein performs many functions to keep the body healthy:

- Keeps immune system healthy
- Creates and signals hormones
- Builds and repairs body tissue
- Supplies energy
- Maintains cell growth by forming new body tissue
- Helps form enzymes and some hormones and antibodies

- Proteins are made up of amino acids.
- The body needs 20 amino acids to stay healthy. There are 11 non-essential amino acids and nine essential amino acids.
- Non-essential amino acids are considered non-essential because the body can produce them from chemicals already present in the body, and they do not need to be included in the food we eat.
- The nine essential amino acids must come from the food we eat.
- Foods that contain the nine essential amino acids are considered to be complete proteins.
- Foods that contain some but not all of the nine essential amino acids are considered incomplete proteins.
- Animal products are the best sources of complete protein.
- Soybeans are the only plant source of complete protein.
<table>
<thead>
<tr>
<th>Cooked Meat 3oz (90 g)</th>
<th>Cost per lb</th>
<th>Servings per lb</th>
<th>Cost per serving</th>
<th>Nutritional Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Protein g</td>
</tr>
<tr>
<td>90% Lean Beef</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>84% Lean Pork</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bison</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prawn/freshwater shrimp</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trout</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catfish</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paddlefish caviar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lamb/mutton</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duck</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Squirrel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rabbit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venison</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walnuts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazelnuts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soybeans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hickory nuts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunflower seed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pumpkin seed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not Sold To Consumers
<table>
<thead>
<tr>
<th>Protein</th>
<th>Fats</th>
<th>Cholesterol</th>
<th>Iron</th>
<th>Calories</th>
<th>Carbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>9.38</td>
<td>86</td>
<td>2.448</td>
<td>211</td>
<td>0</td>
</tr>
<tr>
<td>16.191</td>
<td>9.66</td>
<td>86</td>
<td>0.99</td>
<td>212</td>
<td>0</td>
</tr>
<tr>
<td>15.696</td>
<td>7.41</td>
<td>89</td>
<td>1.089</td>
<td>190</td>
<td>0</td>
</tr>
<tr>
<td>18.21</td>
<td>2.42</td>
<td>82</td>
<td>3.078</td>
<td>143</td>
<td>0</td>
</tr>
<tr>
<td>14.04</td>
<td>5.4</td>
<td>135</td>
<td>2.6</td>
<td>64.8</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>5</td>
<td>59</td>
<td>1.6</td>
<td>128</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
<td>61</td>
<td>0.3</td>
<td>89</td>
<td>0</td>
</tr>
<tr>
<td>22.14</td>
<td>16.11</td>
<td>529.2</td>
<td>10.6</td>
<td>226.8</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>3</td>
<td>64</td>
<td>3.2</td>
<td>122</td>
<td>0</td>
</tr>
<tr>
<td>24</td>
<td>3</td>
<td>63</td>
<td>1.5</td>
<td>144</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
<td>97</td>
<td>1.1</td>
<td>498</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>9</td>
<td>75</td>
<td>2.7</td>
<td>168</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>4</td>
<td>103</td>
<td>5.8</td>
<td>147</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>3</td>
<td>105</td>
<td>4.1</td>
<td>147</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>67</td>
<td>3.5</td>
<td>128</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>51</td>
<td>0</td>
<td>2.7</td>
<td>519</td>
<td>9</td>
</tr>
<tr>
<td>12</td>
<td>51</td>
<td>0</td>
<td>3.9</td>
<td>528</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>0</td>
<td>2.1</td>
<td>117</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
<td>1.2</td>
<td>99</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>0</td>
<td>1.8</td>
<td>120</td>
<td>21</td>
</tr>
<tr>
<td>12</td>
<td>54</td>
<td>0</td>
<td>1.8</td>
<td>552</td>
<td>15</td>
</tr>
<tr>
<td>18</td>
<td>42</td>
<td>0</td>
<td>4.5</td>
<td>492</td>
<td>18</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>0</td>
<td>2.7</td>
<td>375</td>
<td>45</td>
</tr>
</tbody>
</table>

Graph Examples

Calories

- Prawn/freshwater shrimp
- trout
- catfish
- paddlefish caviar

Nuts & Seeds Nutrients

- Protein g
- Fat g
- calorie g
- Carb g

WILD GAME NUTRIENTS

- carb g
- calories g
- fat g
- Protein g

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Group Protein Presentation Requirements

• Visual representation (PowerPoint®, posters, drawings, photos, graphs, brochure, etc.)
• Breed or variety of protein
• Incomplete or complete protein
• Possible cuts or sections used
• Nutritional information, number of recommended servings, and serving sizes according to the USDA Dietary Guidelines
• Where in Kentucky the protein is produced and processed
• Places in Kentucky to purchase item (name and contact information)
• Whether it can be used in the school cafeteria and how it could be used by the food service department
• Preparation techniques
• 1 to 2 healthy recipes (these can be submitted to food service director for use. If that is possible ask the food service director for specific information to address and cost per serving possibilities)

Resources:

Go Lean with Protein  NEP 205

How Much is Enough?  NEP 205A

Wild Game: From Field to Table FN-SSB.044

Kentucky USDA Processing plants that slaughter Handout 7-2

USDA Inspected Plants in Kentucky-Handout 7-3

Kentucky Proud http://www.kyproud.com/

Kentucky Market Maker http://ky.marketmaker.uiuc.edu/


Self Nutritional Data http://nutritiondata.self.com/ (nutrition information)

U.S. Poultry and Egg Association http://www.poultryegg.org/

Beef Marketing and Educational Resources http://www.beef.org/

Pork Checkoff http://www.pork.org/default.aspx
MEAT AND BEAN GROUP
Go Lean with Protein

We all need protein in our diet every day. Meat, poultry, and fish supply protein, as well as iron and other vitamins and minerals. Other foods that provide protein and many of the same vitamins and minerals are:

▲ Shellfish
▲ Wild game
▲ Dry peas and beans
▲ Eggs
▲ Nuts and seeds
▲ Peanut butter

These foods belong in the Meat and Bean Group, as well.

MyPyramid shows that fewer calories should be eaten from foods in the Meat and Bean Group than from foods in the Grains, Vegetables, Fruits, and Milk groups. The U.S. Department of Agriculture’s Dietary Guidelines recommend different amounts of food from the Meat and Bean Group for different people, depending on their need for calories. To find the best amount of food from the Meat and Bean Group to eat every day, visit <http://www.MyPyramid.gov> or complete MyPyramid Worksheet (NEP-201C).

Serving It Up
1-ounce equivalent of food from the Meat and Beans Group is:

▲ 1 ounce cooked lean meat, poultry, or fish
▲ ¼ cup cooked dry beans or peas
▲ ½ ounce nuts or seeds
▲ 1 egg
▲ 1 tablespoon peanut butter

• About 1 ounce of nuts will fit in a cupped hand.
• A palm is about the same size as 3 ounces of meat.
• A deck of playing cards may also be used to estimate 3 ounces of meat.
Did You Know?

• Protein is used for body growth and repair of skin, hair, nails, and muscles. It also helps heal wounds and fight infection.

• Iron helps form red blood cells. It's also important for getting oxygen to the body's cells. The best sources of iron are organ meats such as liver, dry beans, and red meats such as pork and beef. Liver is high in cholesterol.

Stretching Your Dollar

Meat is one of the most costly food items. Most Americans eat more meat than they need. Extra calories from meat are burned for energy or stored as body fat. The following ideas can save money and still provide ample protein:

• Limit serving sizes to 2 to 3 ounces.

• Serve beans, peanut butter, or eggs instead of meat.

• Use leftovers in casseroles, soups, stews, salads, or sandwiches.

• Use meat bones and poultry wings and necks to make stock for soup. Add leftover meat, rice, or noodles and vegetables to make a hearty meal.

• Buy whole chickens and large cuts of meat and cut them into pieces for several meals. Freeze any meat that you can't use within two days. Ground meats lose quality more quickly than larger cuts.

• Compare prices for meat by cost per serving rather than cost per pound. (Estimate servings for meat with bones versus meat without bones. Consider fat content of meat when estimating servings.)

Best Buys in Meat, Poultry, Fish, and Beans

▲ Dry beans, peas, lentils
▲ Ground beef or pork
▲ Eggs
▲ Whole turkey or chicken
▲ Peanut butter
▲ Cured ham with bone
▲ Frozen fish fillets
▲ Pork loin or shoulder
▲ Pork loin or shoulder roast with bone
▲ Canned tuna or mackerel
▲ Liver

Written by Kathy Daly-Koziel, former EFNEP Coordinator
Revised by Jackie Walters, MBA, RD, LD, Extension Associate for Nutrition Education Programs
# MEAT AND BEAN GROUP

## How Much Is Enough?

Price per pound is not the whole story. That pound of meat may be lean and boneless or it could contain more bone, gristle, and fat than lean meat.

## Purchasing Guidelines

<table>
<thead>
<tr>
<th>Type of Meat</th>
<th>Market Unit</th>
<th>Servings per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boneless meats such as ground beef, stew meat, ready-to-serve ham, bologna, liver, round steak, flank steak</td>
<td>1 pound</td>
<td>4</td>
</tr>
<tr>
<td>Meat with some bone and fat such as beef chuck, pork shoulder, picnic ham, most roasts, pork chops, steaks</td>
<td>1 pound</td>
<td>3</td>
</tr>
<tr>
<td>Meat with much waste such as short ribs, spareribs, chicken wings, and backs</td>
<td>1 pound</td>
<td>1 or 2</td>
</tr>
<tr>
<td>Chicken, whole fryer</td>
<td>3 pounds</td>
<td>5 or 6</td>
</tr>
<tr>
<td>Fish, canned</td>
<td>15 to 16 ounces</td>
<td>4</td>
</tr>
<tr>
<td>Tuna</td>
<td>7 ounces</td>
<td>2</td>
</tr>
</tbody>
</table>

**Note:** One pound of dry beans makes 6 cups when cooked. A 1-pound can of cooked beans is 2 cups.

**Reminder:** Meat, fish, and poultry spoil easily. Buy only as much as you can use or store before they spoil.

## Which is the best buy?

- 3-pound whole chicken for $4.49
- Skinless, boneless chicken breasts for $3.99 per pound?
Store It Right

• Remove cooked stuffing from chicken or turkey and store it separately.
• Store peanut butter, dry beans, and canned beans in the cupboard. After opening, store peanut butter in the refrigerator.
• Cover cooked beans and store them in the refrigerator. Use them within three to four days or freeze for later use in another recipe, such as chili or soup.
• Fresh meats and other animal foods spoil quickly. They should be stored in the coldest part of the refrigerator. Here are some guidelines for storing meats in the refrigerator:
  * Fish, poultry, and ground meat keep one to two days.
  * Roasts, steaks, and chops keep three days.
  * Leftover cooked meats and main dishes keep one to two days.
  * Gravy and poultry stuffing keep one to two days.
  * For longer storage, wrap and freeze meat, fish, and poultry immediately after buying or cooking.
WILD GAME: FROM FIELD TO TABLE

Since prehistoric days, we have been hunting wild game, both for food and for profit. Handling of game meat from field to table (killing, storing, and eating), can make a difference in flavor and taste. Undesirable flavors in the meat may be due to inadequate bleeding, carelessness in dressing, or failure to promptly cool the carcass.

Types of Game Meat

Kentucky forests and waters offer a wide variety of small and large game, fowl, reptiles, and amphibians.

<table>
<thead>
<tr>
<th>Birds</th>
<th>Mammals</th>
<th>Amphibians and Reptiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark</td>
<td>Light</td>
<td>Fatty</td>
</tr>
<tr>
<td>Dove</td>
<td>Grouse</td>
<td>Opossum</td>
</tr>
<tr>
<td>Duck</td>
<td>Quail</td>
<td>Raccoon</td>
</tr>
<tr>
<td>Goose</td>
<td>Turkey</td>
<td>Groundhog</td>
</tr>
<tr>
<td>Woodcock</td>
<td></td>
<td>Bear</td>
</tr>
<tr>
<td>Wilson’s Snipe</td>
<td>Hog</td>
<td>Deer</td>
</tr>
</tbody>
</table>

Field Safety and Handling

Whether you enjoy hunting small rabbits or large deer, the procedures for dressing animals are basically the same.

1. Bleed the animal.
2. Remove the entrails and skin soon after the kill to ensure rapid heat loss and the best meat quality.
3. Clean the animal and keep it clean.
4. Cool quickly and thoroughly by hanging the carcass. Spoilage hastens if the carcass is left on the ground to cool. Refrigerate as soon possible.

Aging the meat will depend on factors such as the temperature at the time of harvest, the chilling rate, the animal’s age, storage facilities for aging, and the intended use of the meat.

Aging is defined as holding cuts of meat at temperatures between 34 F and 37 F for 10 to 14 days. If you prefer to age your meat, do not remove the skin, as this may result in dehydration, excessive weight loss, and surface discoloration of the lean tissue.

Always observe Kentucky game laws, kill only what you can use, and kill quickly and humanely.
Cooking Wild Game

Wild game may have a different flavor and texture than domestic meat. But wild game can be delicious if properly prepared. Because game meat tends to be drier and less tender than domestic meat, it is better to use slow and moist-heat cooking methods. Since the meat has only a small amount of fat covering, it may require the addition of cream, butter, or cooking oil to maintain the juiciness of the meat. Trim any excess fat from the carcass to decrease the strong flavors present. Serve the meat either piping hot or well chilled, since the fat from large game animals such as deer, moose or elk is highly saturated and will produce unpleasant flavors.

Methods of Cooking Game

<table>
<thead>
<tr>
<th>Meat</th>
<th>Braise</th>
<th>Fry</th>
<th>Roast</th>
<th>BBQ</th>
<th>Broil</th>
<th>Smoke</th>
<th>Stew</th>
<th>Bake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Dove</td>
<td>☐</td>
<td>✔</td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Duck</td>
<td></td>
<td>☐</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Frog Legs</td>
<td></td>
<td>☐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Goose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Groundhog</td>
<td>✔</td>
<td>✔</td>
<td>☐</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Opossum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Quail</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Rabbit</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Raccoon</td>
<td>✔</td>
<td>✔</td>
<td>☐</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Rattlesnake</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td></td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Squirrel</td>
<td></td>
<td>☐</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
<td></td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Turtle</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

☐ Denotes preferred method of cooking

Storing Game

Refrigerate game meat as soon as possible after the kill. Blood may be removed from meat by allowing the meat to soak in salted water overnight. Then rinse, dry well, and prepare or freeze for later use. To freeze meat, use an airtight, moisture-proof container or wrap in freezer-safe plastic wrap with an overlay of aluminum foil. Be sure to label the contents. Game meat can be safely stored in the same way as domestic meat.
Recipes for Wild Game

Impossible Meat Pie
1 pound rabbit meat, cooked, in pieces  ¾ cup biscuit mix
½ cup part-skim mozzarella cheese, shredded  2 eggs
1 (6-ounce) can tomato paste  1 cup skim milk
1 teaspoon oregano, dried  ½ teaspoon pepper
½ teaspoon basil, dried  1 teaspoon salt
½ cup cottage cheese, 1%  

Combine meat, cheese, tomato paste, oregano, and basil in a small bowl. Combine biscuit mix, eggs, milk, pepper, and salt in a small bowl. Spread cottage cheese into a 9-inch deep-dish pie pan. Spread meat mixture over cottage cheese. Spread biscuit mix mixture over meat. Sprinkle with cheese. Bake at 350 F for 30 minutes or until brown and knife comes out clean. Let stand 5 minutes before slicing. Nutritional Analysis (¾ slice): 290 calories, 39g protein, 15g carbohydrate, 8g fat

Baked Barbecued Rabbit
2 ¾ pound rabbit, cooked, in pieces  2 tablespoons vinegar
Salt and pepper to taste  1 teaspoon prepared mustard
2 (8-ounce) cans tomato sauce  1 teaspoon garlic powder
1 teaspoon Worcestershire sauce  ½ cup brown sugar
1 teaspoon chili powder  1 onion, small, finely-chopped
½ teaspoon red pepper  

Combine all ingredients in 8” x 12” baking dish. Bake at 350 F for 1½ hours or until tender. Nutritional Analysis (4 ounces): 350 calories, 46g protein, 27g carbohydrate, 5g fat

Venison Chili
1 pound ground venison  2 large cans chili beans
1 onion, large, chopped  1 (8 ounce) can tomato sauce
½ green pepper, chopped  1 teaspoon salt
2 tablespoon vegetable oil  1 bay leaf
1 (1 pound) can tomatoes  Chili powder to taste

Brown meat, onion, and pepper in vegetable oil. In dutch oven or very large saucepan, combine remaining ingredients. Simmer 1 hour on low heat, stirring frequently. Remove bay leaf before serving. Nutritional Analysis (4 ounces): 520 calories, 49g protein, 47g carbohydrate, 13g fat

Venison Sloppy Joes
5 pound ground venison  10 tablespoons lemon juice
5 onions, medium, chopped finely  2 cans (8 ounce) tomato soup
5 green peppers, chopped  5 tablespoons worcestershire sauce
2 cups chopped celery  1 cup water
1 cup brown sugar  5 teaspoons mustard
10 tablespoons vinegar  

Mix together all ingredients. Cook in a skillet until onions and venison are done. Nutritional Analysis (5 ounces): 480 calories, 64g protein, 37g carbohydrate, 8g fat
Deer Camp Breakfast Sausage
2 pounds ground venison
1 teaspoon marjoram
1 tablespoon sage
1 pound ground pork
1 tablespoon basil
1 teaspoon dry mustard
1 egg
½ cup bread crumbs
¾ cup cooking oil
1 tablespoon of oil

Combine meats and seasonings, mixing together, then add egg and bread crumbs to mixture. Stir well, shape into patties, and fry in a skillet with oil until golden brown on each side.

Nutritional Analysis (3 ounces): 230 calories, 24g protein, 2g carbohydrate, 13g fat

<table>
<thead>
<tr>
<th>Meat</th>
<th>Calories</th>
<th>Total Fat</th>
<th>Saturated Fat</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer</td>
<td>103</td>
<td>2</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Dove</td>
<td>123</td>
<td>2.0</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Duck (breast w/o skin)</td>
<td>105</td>
<td>4.0</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Frog Legs</td>
<td>62</td>
<td>.25</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td>Goose (w/o skin)</td>
<td>137</td>
<td>6</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>Groundhog</td>
<td>188</td>
<td>9</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Opossum</td>
<td>188</td>
<td>9</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Quail (breast w/o skin)</td>
<td>104</td>
<td>3</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Rabbit</td>
<td>97</td>
<td>2</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Raccoon</td>
<td>180</td>
<td>10</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Squirrel</td>
<td>102</td>
<td>3</td>
<td>-</td>
<td>18</td>
</tr>
<tr>
<td>Turkey (white meat)</td>
<td>135</td>
<td>6</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Turtle</td>
<td>76</td>
<td>.5</td>
<td>-</td>
<td>17</td>
</tr>
</tbody>
</table>

References:

Clip art Microsoft® 2007.
Nutritional Analysis ESHA (2004), Food Processor.

Sandra Bastin, PhD, RD, LD, CCE
Extension Food and Nutrition Specialist

March 1996; Revised July 2007
Kentucky USDA Processors Who Slaughter

Bill Opell's Meat Processing  
22515 Bear Creek Road.  
Cattlettsburg, KY 41129  
(606) 928-5094

Bluegrass Lamb and Goat LLC  
3060 Cartersville Road  
Paint Lick, KY 40461  
(859)-925-2000

Boone's Abattoir, Inc.  
100 Bloomfield Pike  
Bardstown, KY 40004  
(502) 348-3668  
Jerry & Matt Boone

Brooksville Meat Fab.Center Rt.  
80 Liberty Drive  
Brookesville, KY 41001  
(606) 735-2250

C&P Processing  
90 A.J. Sutton Rd.  
Williamsburg, KY 40769  
(606) 549-1151  
Tony Thorpe

C&W Meat Packers  
312 W. Pearl St.  
Cynthiana, KY 41031  
(859) 234-4121  
Carla Courtney

Central Kentucky Meats, Inc  
6256 KY 1859  
Liberty, KY 42539  
(606)-787-4851

Custom Meats, Inc  
169 W. Old Middle Creek Road  
Prestonsburg, Ky 41653  
Paul Marsillett  
Office- (606)-886-6003  
Cell (606)-226-2428  
Fax (606)-886-6033  
custommeats@yahoo.com

Fairplay Meat Processing  
275 Jack Smith Road.  
Columbia, KY 42728  
(270) 384-4024  
Foster Graves

Farmer's Slaughter House  
181 Fowler Road.  
Mayfield, KY 42066  
(270) 247-7389

Foothills Country Meats  
P.O. Box 156  
Monticello, KY 42635  
(606) 348-3852  
Ryan Gregory

1890 Pembroke Road.  
Hopkinsville, KY 42240  
(270) 885-8474

Ernie Hampton  
Harmon Brothers Meats  
425 Ambrose  
Warsaw, KY 41095  
(859) 567-1212

Dave Harmon  
Hubble Meat Market  
195 White Oak Road  
Lancaster, KY 40444  
Hal Akers  
(606)-365-4994

John's Custom Meats, LLC  
John Rediess, Jr.  
5180 Hydro-Pondsville Rd.  
Smith's Grove, KY 42171  
(270)-563-4048

Kirby & Poe Slaughterhouse  
581 Kirby & Poe Road.  
Alvaton, KY 42122  
(270) 843-1709

Lairds Meat Co.  
301 E. 12th St.  
Benton, KY 42025
(270) 527-3821
Loretto Butcher Shop
700 Spencer Hamilton Road
Loretto, KY 40037
Jody Mattingly
(270)-865-3676
cell (502)-507-0399
lorettobutchershop@windstream.net

Marksbury Farm Foods LLC
7907 Nicholasville Road
Lancaster, KY 40444
Greg Correll
(859)-548-2333

Mobile Processing Unit
Kentucky State University
Steve Skeleton
(502)-597-7501

S & S Enterprises
9020 Richardsville Road
Bowling Green, KY 42101
(270) 777-0240

The Chop Shop
130 KY 250 North
Campton, KY 41301
Mark Schaad
(606)-743-9044

U.M. Miller
3425 Railroad St.
Cattlettsburg, KY 41129
(606) 739-5301

Wise Meat Packing Co.
2205 Longbranch Road.
Campbellsville, KY 42718
(270) 465-8464 (just hogs USDA)
The yellow smiley faces indicate USDA-inspected plants. Figure out the names and specific locations of each.
Poultry Questions

1. What color are chicken eggs?
   A. Brown and grey
   B. Moldy green
   C. White to brown and other pale colors
   D. Purple

2. Roosters can be quite ________________.
   A. Calm
   B. Funny
   C. Dull
   D. Aggressive

3. Seven of a chicken’s predators are?
   A. Skunks, owls, raccoons, hawks, opossums, dogs, and snakes
   B. Skunks, rabbits, pigs, bulls, eagles, cats, and dogs
   C. None of the above
   D. All of the above

4. What is one thing a chicken eats?
   A. Insects
   B. Dog food
   C. Steak
   D. Tomato

5. What is the most common laying hen?
   A. Buff Orpington
   B. White Leghorn
   C. Plymouth Rock
   D. Australorp

6. A chicken’s body temperature is normally
   A. 68-69 degrees F
   B. 96-98 degrees F
   C. 99-100 degrees F
   D. 102-103 degrees F

7. It takes a hen how many hours to lay an egg?
   A. 48-50 hours
   B. 36-38 hours
   C. 24-26 hours
   D. 12-14 hours

8. How many days does it take for a chicken to hatch?
   A. 18 days
   B. 21 days
   C. 28 days
   D. None of the above

9. Chickens are not capable of sustained flight?
   A. True
   B. False

10. It takes 4 lbs-plus of feed to make how many dozen eggs?
    A. 1 dozen
    B. 2 dozen
    C. 3 dozen
    D. 4 dozen

11. Chickens lay different colored eggs, from white to brown to green to pink to blue.
    A. True
    B. False
12. An egg starts growing into a chick when it reaches a temperature of?
   A. 78 degrees F
   B. 86 degrees F
   C. 92 degrees F
   D. 100 degrees F

13. A hen lives an average of five to seven years, but can live up to 20 years. She'll lay eggs her entire life, with production decreasing every year.
   A. True
   B. False

14. The chicken was once considered a sacred animal symbolizing the?
   A. Moon
   B. Stars
   C. Sun
   D. Wind

15. Grocery store chickens are how many weeks old?
   A. 4-6
   B. 5-8
   C. 12-14
   D. None of the above

16. Americans consume how many billions of chickens a year?
   A. 3
   B. 8
   C. 12
   D. 20

17. In 1925, hens laid an average of 100 eggs a year. In 1979, the world record was set by a White Leghorn that laid _____ eggs in 364 days.
   A. 254
   B. 322
   C. 371
   D. 421
Poultry Questions Key

1. What color are chicken eggs?
   A. Brown and grey
   B. Moldy green
   C. White to brown and other pale colors
   D. Purple

2. Roosters can be quite ____________________.
   A. Calm
   B. Funny
   C. Dull
   D. Aggressive

3. Seven of a chicken’s predators are?
   A. Skunks, owls, raccoons, hawks, opossums, dogs, and snakes
   B. Skunks, rabbits, pigs, bulls, eagles, cats, and dogs
   C. None of the above
   D. All of the above

4. What is one thing a chicken eats?
   A. Insects
   B. Dog food
   C. Steak
   D. Tomato

5. What is the most common laying hen?
   A. Buff Orpington
   B. White Leghorn
   C. Plymouth Rock
   D. Austrlorp

6. A chicken’s body temperature normally runs at?
   A. 68-69 degrees F
   B. 96-98 degrees F
   C. 99-100 degrees F
   D. 102-103 degrees F

7. It takes a hen how many hours to lay an egg?
   A. 48-50 hours
   B. 36-38 hours
   C. 24-26 hours
   D. 12-14 hours

8. How many days does it take for a chicken to hatch?
   A. 18 days
   B. 21 days
   C. 28 days
   D. None of the above

9. Chickens are not capable of sustained flight?
   A. True
   B. False

10. It takes 4 lbs-plus of feed to make how many dozen eggs?
    A. 1 dozen
    B. 2 dozen
    C. 3 dozen
    D. 4 dozen

11. Chickens lay different colored eggs, from white to brown to green to pink to blue.
    A. True
    B. False

12. An egg starts growing into a chick when it reaches a temperature of?
    A. 78 degrees F
    B. 86 degrees F
    C. 92 degrees F
    D. 100 degrees F
13. A hen lives an average of five to seven years, but can live up to 20 years. She’ll lay eggs her entire life, with production decreasing every year.
   A. True
   B. False

14. The chicken was once considered a sacred animal symbolizing the?
   A. Moon
   B. Stars
   C. Sun
   D. Wind

15. Grocery store chickens are how many weeks old?
   A. 4-6
   B. 5-8
   C. 12-14
   D. None of the above

16. Americans consume how many billions of chickens a year?
   A. 3
   B. 8
   C. 12
   D. 20

17. In 1925, hens laid an average of 100 eggs a year. In 1979, the world record was set by a White Leghorn that laid _____ eggs in 364 days.
   A. 254
   B. 322
   C. 371
   D. 421
Pork Questions

1. What ancient culture was so loathe to be separated from fresh pork that the departed were sometimes accompanied to the grave with their herd of hogs?
   A. Chinese culture
   B. Japanese culture
   C. American culture

2. Americans favorite pork cut is what?
   A. Ham
   B. Bacon
   C. Pork chops

3. Naturally lean ham comes from what part of the hog?
   A. Shoulder
   B. Belly
   C. Hind legs

4. What gives ham its unique briny flavor?
   A. The natural flavor of the hog
   B. The curing process
   C. The result of the hog’s diet

5. What was one of the first forms of trade in early America?
   A. Coffee
   B. Cured hams
   C. Company stocks

6. What does the term “fresh ham” mean?
   A. Ham that has been cured
   B. Freshly cured ham
   C. Ham that has not been frozen

7. The slogan the pork industry introduced in 1987 to inform the public that pork had changed and was a lean meat was:
   A. Pork. Now That’s Good
   B. Pork. The Other White Meat
   C. Pork. It’s A Good Thing

8. Pork is how much leaner than 15 years ago?
   A. 2 percent
   B. 10 percent
   C. 16 percent

9. What cut of pork is just as lean as a skinless chicken breast?
   A. Pork ribs
   B. Pork chop
   C. Pork tenderloin

10. Today’s pork should be cooked to the internal doneness of?
    A. 145 degrees°F
    B. 180 degrees°F
    C. 160 degrees°F

11. What does grilling pork over “direct heat” mean?
    A. Placing the pork directly over the flames
    B. Arranging the hot coals in an even bed on the fire and placing the pork above the heat
    C. Rotating the pork on a spit over open flames
12. What’s the traditional grilled food at a Hawaiian luau?
   A. Grilled pineapple slices
   B. Grilled chicken
   C. A whole hog, roasted to perfection by digging a pit in the earth, filled with hardwood and a slow fire of hot coals

13. What country is the No.1 producer and consumer of fresh pork in the world?
   A. United States
   B. India
   C. China

14. When looking for the leanest cuts of pork look for the word “Loin”?
   A. True
   B. False

15. Pork is a great source of protein and B-Vitamins.
   A. True
   B. False

16. Which roast comes from the area of the pig between the shoulder and the beginning of the leg?
   A. Loin roast
   B. Rack of pork
   C. Crown roast

17. Which roast is also known as the pork rib roast and makes a show-stopping centerpiece for an elegant dinner?
   A. Crown roast
   B. Rack of pork
   C. Loin roast

18. Which roast is not commonly found in supermarkets, but can be ordered from your butcher? It is sometimes called fresh ham.
   A. Rack of pork
   B. Leg of pork
   C. Loin roast

19. What U.S. city became known as Porkopolis?
   A. Louisville
   B. Cincinnati
   C. Omaha

20. How much did the heaviest hog ever recorded weigh?
   A. 600 lb
   B. 2,552 lb
   C. 1000 lb

21. How did Wall Street get its name?
   A. From a pig named Wall Street
   B. It was named after a famous man named Wall Street
   C. Hogs roamed through the fields of New York City, so residents decided to put up a wall to restrict the hogs; and later a street passed along the wall.

22. What staple food was provided to Washington’s troops at Valley Forge?
   A. Salt pork
   B. Roast beef
   C. Hamburgers

23. What does “living high on the hog” mean?
   A. Pork producers make a lot of money
   B. Pork is so good and juicy
   C. Living well
24. What's the highest price ever paid for a hog?
   A. $1,000
   B. $25,000
   C. $105,000

25. Kentucky has how many hogs and pigs statewide?
   A. 50,000
   B. 370,000
   C. 1 million

26. Kentucky ranks ______ in the nation for pork production?
   A. 10th
   B. 20th
   C. 50th

27. What is the top pork producing county?
   A. Nelson
   B. Fayette
   C. Jefferson
Pork Questions Key

1. What ancient culture was so loathe to be separated from fresh pork that the departed were sometimes accompanied to the grave with their herd of hogs?
   A. Chinese culture
   B. Japanese culture
   C. American culture

2. Americans favorite pork cut is what?
   A. Ham
   B. Bacon
   C. Pork chops

3. Naturally lean ham comes from what part of the hog?
   A. Shoulder
   B. Belly
   C. Hind legs

4. What gives ham its unique briny flavor?
   A. The natural flavor of the hog
   B. The curing process
   C. The result of the hog’s diet

5. What was one of the first forms of trade in early America?
   A. Coffee
   B. Cured hams
   C. Company stocks

6. What does the term “fresh ham” mean?
   A. Ham that has been cured
   B. Freshly cured ham
   C. Ham that has not been frozen

7. The slogan the pork industry introduced in 1987 to inform the public that pork had changed and was a lean meat was:
   A. Pork. Now That’s Good
   B. Pork. The Other White Meat
   C. Pork. It’s A Good Thing

8. Pork is how much leaner than 15 years ago?
   A. 2 percent
   B. 10 percent
   C. 16 percent

9. What cut of pork is just as lean as a skinless chicken breast?
   A. Pork ribs
   B. Pork chop
   C. Pork tenderloin

10. Today’s pork should be cooked to the internal doneness of?
    A. 145 degrees°F
    B. 180 degrees°F
    C. 160 degrees°F

11. What does grilling pork over “direct heat” mean?
    A. Placing the pork directly over the flames
    B. Arranging the hot coals in an even bed on the fire and placing the pork above the heat
    C. Rotating the pork on a spit over open flames

12. What’s the traditional grilled food at a Hawaiian luau?
    A. Grilled pineapple slices
    B. Grilled chicken
    C. A whole hog, roasted to perfection by digging a pit in the earth, filled with hardwood and a slow fire of hot coals

13. What country is the No.1 producer and consumer of fresh pork in the world?
    A. United States
    B. India
    C. China
14. When looking for the leanest cuts of pork look for the word “Loin”.
   A. True
   B. False

15. Pork is a great source of protein and B-Vitamins.
   A. True
   B. False

16. Which roast comes from the area of the pig between the shoulder and the beginning of the leg?
   A. Loin roast
   B. Rack of pork
   C. Crown roast

17. Which roast is also known as the pork rib roast and makes a show-stopping centerpiece for an elegant dinner?
   A. Crown roast
   B. Rack of pork
   C. Loin roast

18. Which roast is not commonly found in supermarkets, but can be ordered from your butcher? It is sometimes called fresh ham.
   A. Rack of pork
   B. Leg of pork
   C. Loin roast

19. What U.S. city became known as Porkopolis?
   A. Louisville
   B. Cincinnati
   C. Omaha

20. How much did the heaviest hog ever recorded weigh?
   A. 600 lb
   B. 2,552 lb
   C. 1000 lb

21. How did Wall Street get its name?
   A. From a pig named Wall Street
   B. It was named after a famous man named Wall Street
   C. Hogs roamed through the fields of New York City, so residents decided to put up a wall to restrict the hogs; and later a street passed along the wall.

22. What staple food was provided to Washington’s troops at Valley Forge?
   A. Salt pork
   B. Roast beef
   C. Hamburgers

23. What does “living high on the hog” mean?
   A. Pork producers make a lot of money
   B. Pork is so good and juicy
   C. Living well

24. What’s the highest price ever paid for a hog?
   A. $1,000
   B. $25,000
   C. $105,000

25. Kentucky has how many hogs and pigs statewide?
   A. 50,000
   B. 370,000
   C. 1 million

26. Kentucky ranks ______ in the nation for pork production?
   A. 10th
   B. 20th
   C. 50th

27. What is the top pork producing county?
   A. Nelson
   B. Fayette
   C. Jefferson
Beef Questions

1. You should always cook ground beef to what internal temperature?
   A. 140 degrees°F
   B. 150 degrees°F
   C. 160 degrees°F

2. All beef that is sold must be?
   A. Inspected
   B. Written on
   C. Taste-tested first

3. Beef is the No. 1 source of protein, vitamin B12, and zinc.
   A. True
   B. False

4. How many essential vitamins does beef contain?
   A. 4
   B. 9
   C. 12

5. To get the same amount of zinc in a 3 ounce serving of beef, how many cans of tuna would you have to eat?
   A. 1 3-ounce serving
   B. 13 3-ounce servings
   C. 20 3-ounce servings

6. A 3 ounce serving of beef provides what percentage of your daily value for protein?
   A. 10%
   B. 20%
   C. 51%

7. Prime, Choice, Select, Standard, Commercial, Utility, Cutter, and Canner are all USDA Quality grades.
   A. True
   B. False

8. What is marbling in the beef?
   A. A marble ball
   B. It’s a game that is played on beef
   C. Visible flecks of fats within the muscle

9. How much spinach would you have to eat in order to receive the amount of iron in a 3 ounce serving of beef?
   A. ½ cup
   B. 1 cup
   C. 2-3/4 cups

10. The biggest burger the world has ever seen required a grill that was the size of a two-car garage. The burger weighed about 5,005 lb and fed 2,000 people in Seymour, Wisconsin. In what year did that take place?
    A. 2050
    B. 1901
    C. 1989

11. Burgers account for half of the sandwiches that are served in restaurants.
    A. True
    B. False

12. When was the hamburger invented?
    A. 1800
    B. 1904
    C. 2005
13. What two words do you look for to find the leanest beef steaks?
   A. Chuck
   B. Rib
   C. Loin
   D. Round
   E. Flank
   F. Brisket

14. What is the most popular holiday for barbecuing?
   A. Memorial Day
   B. Fourth of July
   C. Labor Day

15. How many cuts of lean beef are there?
   A. 11
   B. 21
   C. 29

16. Which is the most popular steak cut served in restaurants?
   A. Rib-eye
   B. Tenderloin/filet mignon
   C. Top sirloin

17. What type of beef is consumers’ favorite?
   A. Ground beef
   B. Roast beef
   C. Steaks

18. Kentucky is the largest beef producing state east of what major river?
   A. Mississippi
   B. Missouri
   C. The Nile

19. Where does Kentucky rank nationally as far as beef production?
   A. 8th largest
   B. 10th largest
   C. 12th largest

20. Kentucky has over ____ million head of cattle?
    A. 1
    B. 2
    C. 4

21. How many cowhides does it take to produce enough leather to make 20 footballs?
    A. 1
    B. 5
    C. 10

22. Crayons, paints, and candles are all made from the fats and protein from cattle by-products.
    A. True
    B. False

23. Cowhides can also be beneficial in making?
    A. Glass, wood, and metal
    B. Belts, boots, and gloves
    C. Vegetables, nuts, and fruits

24. Glue from beef protein is used in automobiles bodies.
    A. True
    B. False
Beef Questions Key

1. You should always cook ground beef to what internal temperature?
   A. 140 degrees°F
   B. 150 degrees°F
   C. 160 degrees°F

2. All beef that is sold must be?
   A. Inspected
   B. Written on
   C. Taste-tested first

3. Beef is the No. 1 source of protein, vitamin B12, and zinc.
   A. True
   B. False

4. How many essential vitamins does beef contain?
   A. 4
   B. 9
   C. 12

5. To get the same amount of zinc in a 3 ounce serving of beef, how many cans of tuna would you have to eat?
   A. 1 3-ounce serving
   B. 13 3-ounce servings
   C. 20 3-ounce servings

6. A 3 ounce serving of beef provides what percentage of your daily value for protein?
   A. 10%
   B. 20%
   C. 51%

7. Prime, Choice, Select, Standard, Commercial, Utility, Cutter, and Canner are all USDA Quality grades.
   A. True
   B. False

8. What is marbling in the beef?
   A. A marble ball
   B. It’s a game that is played on beef
   C. Visible flecks of fats within the muscle

9. How much spinach would you have to eat in order to receive the amount of iron in a 3 ounce serving of beef?
   A. ½ cup
   B. 1 cup
   C. 2-3/4 cups

10. The biggest burger the world has ever seen required a grill that was the size of a two-car garage. The burger weighed about 5,005 lb and fed 2,000 people in Seymour, Wisconsin. In what year did that take place?
    A. 2050
    B. 1901
    C. 1989

11. Burgers account for half of the sandwiches that are served in restaurants.
    A. True
    B. False

12. When was the hamburger invented?
    A. 1800
    B. 1904
    C. 2005

13. What two words do you look for to find the leanest beef steaks?
    A. Chuck
    B. Rib
    C. Loin
    D. Round
    E. Flank
    F. Brisket
14. What is the most popular holiday for barbecuing?
   A. Memorial Day  
   B. Fourth of July  
   C. Labor Day

15. How many cuts of lean beef are there?
   A. 11  
   B. 21  
   C. 29

16. Which is the most popular steak cut served in restaurants?
   A. Rib-eye  
   B. Tenderloin/filet mignon  
   C. Top sirloin

17. What type of beef is consumers’ favorite?
   A. Ground beef  
   B. Roast beef  
   C. Steaks

18. Kentucky is the largest beef producing state east of what major river?
   A. Mississippi  
   B. Missouri  
   C. The Nile

19. Where does Kentucky rank nationally as far as beef production?
   A. 8th largest  
   B. 10th largest  
   C. 12th largest

20. Kentucky has over _____ million head of cattle?
    A. 1  
    B. 2  
    C. 4

21. How many cowhides does it take to produce enough leather to make 20 footballs?
    A. 1  
    B. 5  
    C. 10

22. Crayons, paints, and candles are all made from the fats and protein from cattle by-products.
    A. True  
    B. False

23. Cowhides can also be beneficial in making?
    A. Glass, wood, and metal  
    B. Belts, boots, and gloves  
    C. Vegetables, nuts, and fruits

24. Glue from beef protein is used in automobiles bodies.
    A. True  
    B. False
LEsson 8

WRAPPING IT UP!

“Let’s grow Healthy the Kentucky Proud way!”

Joy Frith, 6th grade, Rockcastle County Middle School

Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.
Lesson Outcomes

1. Use each food group to reach personal nutritional needs according to dietary guidelines.
   Contributing activities
   • Activity 1
   • Activity sheet 8-1

2. Source Kentucky food products.
   Contributing activities
   • Activity 1
   • Activity sheet 8-1
   • Activity 2
   • Activity 3

3. Review locations to purchase fresh, local Kentucky products.
   Contributing activities
   • Activity 2
   • Activity 3

4. Identify different ways “Kentucky Farm 2 School” can be implemented.
   Contributing activities
   • Activity 3

Materials and Equipment

• Activity sheet 8-1 Focus on Food & Farming

• Poster board (optional)

• PowerPoint® (optional)

Additional resources:

10 Good Reasons to Buy Locally Grown Food


Consumer Reports www.consumerreports.org


Fresh Food Central http://www.freshfoodcentral.com/


Lesson Initiation

Bell ringer/class opener:

Have students describe what “Kentucky Farmer” means to them. After students have written the description have them compare it to the bell ringer/class opener from lesson 1.
Lesson Introduction

Activity 1

Use activity sheet 8-1, “Focus on Food and Farming.” This activity is more effective if the students keep a 24 hour food diary. This can be assigned before lesson. Have students list foods they consumed the previous day, along with the serving sizes, in column one. Help them think of everything they ate from the time they got up until they went to bed. Ask questions such as, “Did you eat breakfast? What did you have? How much did you eat? What kind of milk did you drink? Did you put butter on your toast? Did you have any snacks?” In column two have students classify the foods they ate into food groups of MyPlate. In column three have students identify with a yes or no answer which foods were grown or produced by Kentucky farmers. Review the student’s answers, as a group discussion, checking to make sure foods were classified into the correct MyPlate group, the serving sizes were correct, and which foods were produced by Kentucky farmers. An additional topic that could be discussed is what type of Kentucky farmer produced these foods (e.g., beef farmer, grain farmer). Have students compare the first “Focus on Food & Farming” worksheet from the Introduction lesson with this completed worksheet. Did they change their eating habits? Did they eat more (local) Kentucky products? Were students more aware of which foods were produced by Kentucky farmers? *PLEASE ENTER PRE AND POST EVALUATED DATA INTO ONLINE REPORTING SYSTEM.*

Activity 2

(Script)

Throughout the lessons we have talked about Kentucky producers, processors and consumers. As consumers where do we need to go to purchase Kentucky proud foods and consumer goods?

Have students brainstorm ideas and write them down on the board or flip chart paper. Have students get in groups and research, map and locate local areas that make Kentucky Proud foods available to consumers. Have each group develop a poster that can be displayed with their list. Have them include names, locations, contact information (if available), and types of products sold. They could also develop presentations that could be presented to the class and at other community events. (fall festivals, ballgames, site-base council meetings, health fairs and school board meetings). A great resource for finding this information is **www.ca.uky.edu/foods**.

Activity 3

After finding places of purchase, have students determine how these products can be purchased for the school so students can enjoy locally grown and produced products.

• Have students decide which local products they would like to see in their school cafeteria (remember local means Kentucky).

• Have students make a list of places, along with contact information, where the products they have chosen can be purchased (they should list 3 or more).

• Have students contact the school district food service director to present their ideas, products and places of purchase. If students developed
presentations for activity 2 they could alter the information to present the chosen product information to the food service director.

• Have students determine other things they can do to help get Kentucky Proud foods into their school food system. (school gardens, FFA greenhouse/food service collaboration, taste testing, collaborate with the local UK Cooperative Extension office and local farmer meet/greet).
<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading</strong></td>
</tr>
<tr>
<td><strong>Informational</strong></td>
</tr>
<tr>
<td>RI.9-10.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</td>
</tr>
<tr>
<td><strong>Reading Science</strong> &amp; other Technical</td>
</tr>
<tr>
<td>RST.9-10.1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.</td>
</tr>
<tr>
<td>RST.9-10.2. Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</td>
</tr>
<tr>
<td>RST.9-10.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</td>
</tr>
<tr>
<td>RST.9-10.7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.</td>
</tr>
<tr>
<td>RST.9-10.9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
</tr>
<tr>
<td>W.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>W.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</td>
</tr>
<tr>
<td><strong>Writing Science</strong> &amp; other Technical</td>
</tr>
<tr>
<td>WHST.9-10.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>WHST.9-10.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</td>
</tr>
<tr>
<td>WHST.9-10.9. Draw evidence from informational texts to support analysis, reflection, and research.</td>
</tr>
<tr>
<td><strong>Speaking &amp; Listening</strong></td>
</tr>
<tr>
<td>SL.9-10.4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.</td>
</tr>
</tbody>
</table>
# Kentucky Farm 2 School
## Grades 11-12: Lesson 8
### Wrapping It Up!

<table>
<thead>
<tr>
<th>Kentucky Core Academic Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Informational</strong></td>
</tr>
<tr>
<td>RI.11-12.1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.</td>
</tr>
<tr>
<td>RI.11-12.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).</td>
</tr>
<tr>
<td>RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.</td>
</tr>
<tr>
<td><strong>Reading Science &amp; other Technical</strong></td>
</tr>
<tr>
<td>RST.11-12.1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</td>
</tr>
<tr>
<td>RST.11-12.2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</td>
</tr>
<tr>
<td>RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</td>
</tr>
<tr>
<td>RST.11-12.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</td>
</tr>
<tr>
<td>RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</td>
</tr>
<tr>
<td>RST.11-12.8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</td>
</tr>
<tr>
<td>RST.11-12.9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
</tr>
<tr>
<td>W.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td>W.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</td>
</tr>
</tbody>
</table>
## Writing Science & other Technical

WHST.11-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

WHST.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

WHST.11-12.9. Draw evidence from informational texts to support analysis, reflection, and research.

## Speaking & Listening

SL.11-12.2. Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.

SL.11-12.4. Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
Focus on Food and Farming

Food Sourcing – is knowing the beginning or place of origin of the food you consume. The origin of the food in its simplest form.

Examples:

• A red delicious apple can come from a Kentucky orchard or from a New York orchard

• Thick and juicy rib-eye steak could have come from the black angus cattle farm just outside of Lexington, Kentucky or it could have come from a cattle feed lot in Oklahoma.

Remember most food travels 1,500 miles before it gets to your plate! Looking at the food label can help you determine if your product is local (Kentucky Proud – any agricultural product grown, raised, produced, processed, or manufactured in Kentucky [Branscum, 2012]) or if it is transported into the state of Kentucky from another state or country. Food labels provide the name and address of the processor or distributor.
<table>
<thead>
<tr>
<th>FOOD EATEN &amp; SERVING SIZE</th>
<th>IDENTIFY THE MYPLATE GROUP. Grain, vegetable, fruit, dairy, protein</th>
<th>DID YOU SOURCE THIS FOOD ITEM?</th>
<th>PRODUCED BY A KENTUCKY FARMER KENTUCKY PROUD YES/NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAKFAST</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LUNCH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DINNER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNACKS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OILS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOLID FATS &amp; ADDED SUGARS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMPLETE ACTIVITY SHEET TOTALS ON NEXT PAGE.
### Bread Group:
1 oz equivalent is:
- 1 slice bread
- ½ bun or bagel
- ½ cup cooked cereal, rice or pasta
- 1 oz (about 1 cup) dry cereal

### Vegetables:
1 cup is:
- 1 cup fresh, frozen or canned vegetables
- 2 cups raw, leafy greens
- 1 cup vegetable juice

### Fruit:
1 cup is:
- 1 cup of fresh, canned, or frozen fruit
- 1 medium whole fruit
- 1 cup juice
- ½ cup dried fruit

### Protein Group:
1 oz. equivalent is:
- 1 oz. cooked meat, poultry or fish
- 1/4 cup cooked beans
- 1 tbsp peanut butter
- 1 egg
- ½ oz. nuts or seeds

### Dairy:
1 cup is:
- 1 cup of milk or yogurt
- 1 ½ oz of natural cheese
- 2 oz of process cheese

---

**Educational programs of Kentucky Cooperative Extension serve all people regardless of race, color, age, sex, religion, disability, or national origin.**
Pre & Post Test Evaluation/Assessment

Pre-curriculum evaluation results from Focus on Food & Farming, activity 1-2 and 8-1

<table>
<thead>
<tr>
<th></th>
<th>GRAINS</th>
<th>FRUITS</th>
<th>VEGETABLES</th>
<th>DAIRY</th>
<th>PROTEINS</th>
<th>OILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL NUMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OF SERVINGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL NUMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OF KENTUCKY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROUD SERVINGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL NUMBER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OF FOODS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOURCED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Post-curriculum evaluation results from Focus on Food & Farming, activity 8-1

<table>
<thead>
<tr>
<th></th>
<th>GRAINS</th>
<th>FRUITS</th>
<th>VEGETABLES</th>
<th>DAIRY</th>
<th>PROTEINS</th>
<th>OILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL NUMBER OF SERVINGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL NUMBER OF KENTUCKY PROUD SERVINGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL NUMBER OF FOODS SOURCED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comparing your pre-and-post test, do you now check to see where your food was produced and/or processed? ____________

How many more servings of Kentucky Proud products do you consume? ____________

Have you increased the number of fruits and vegetable servings you consume? If yes, how many? ____________
10 Good Reasons To Buy Locally Grown Food

1 Locally grown food tastes and looks better. It was grown close to home and served at peak freshness. It came from down the road, not from across the country or overseas.

2 Local food supports local families. When you buy Kentucky Proud food, you help local farm families make a living. Your business helps them pay the bills, put their kids through school, and stay on the farm.

3 Local food builds trust. In these days of concern for food safety and homeland security, it’s reassuring to look into the eyes of the person who grew your food and be able to drive past the field where it grew.

4 Local food shows you’re Kentucky Proud. Buying local food bearing the familiar Kentucky Proud logo gives this program more meaning. It encourages consumers to look for Kentucky Proud quality and businesses to supply it.

5 Local food preserves farmland. When farmers get more money for their products, they are less likely to sell their land for development.

6 Local food keeps taxes down. Several studies show that farms pay more in taxes than required in services, while most residential developments need more services than they pay for with their taxes.

7 Local food benefits the environment and wildlife. Kentucky farms nestle in a patchwork of fields, meadows, woods, streams, and ponds that provide vital habitat for wildlife.

8 Local food travels shorter distances from farm to plate. On average, food travels 1,500 miles from farm to plate. Each calorie requires an average 10 calories of fuel for travel, refrigeration, and processing. Locally grown food reduces the use of fossil fuels.

9 Local food preserves genetic diversity. Local farms often grow heirloom varieties of fruits and vegetables with superior flavor and nutritional value.

10 Local food is an investment in our future. When you buy from a local grower, you preserve the strength and character of your community for your children and grandchildren.

Kentucky Department of Agriculture
Farm To School Program
kyproud.com
For more information call: (502) 573-0282
Let's grow healthy, the Kentucky Proud Way!

Grant Isaacs, 6th grade, Rockcastle County Middle School
References

Bastin, S. (2012). Fruit rollups from home. Personal communication


POST-LESSON MATERIALS

KENTUCKY FARM 2 SCHOOL


U.S. Department of Agriculture (n.d), Beyond the beef. Retrieved from http://forces.si.edu/main/pdf/6-8-BeyondTheBeef.pdf

