COOPERATIVE EXTENSION SERVICE • **UNIVERSITY OF KENTUCKY** • COLLEGE OF AGRICULTURE • LEXINGTON, KY, 40546

UNIVERSITY OF KENTUCKY
College of Agriculture

KENTUCKY FARM TO SCHOOL PROGRAM

KENTUCKY FARM 2 SCHOOL

CURRICULUM

9TH - 12TH GRADES

Janet Drake, 8th grade, Woodford Middle School

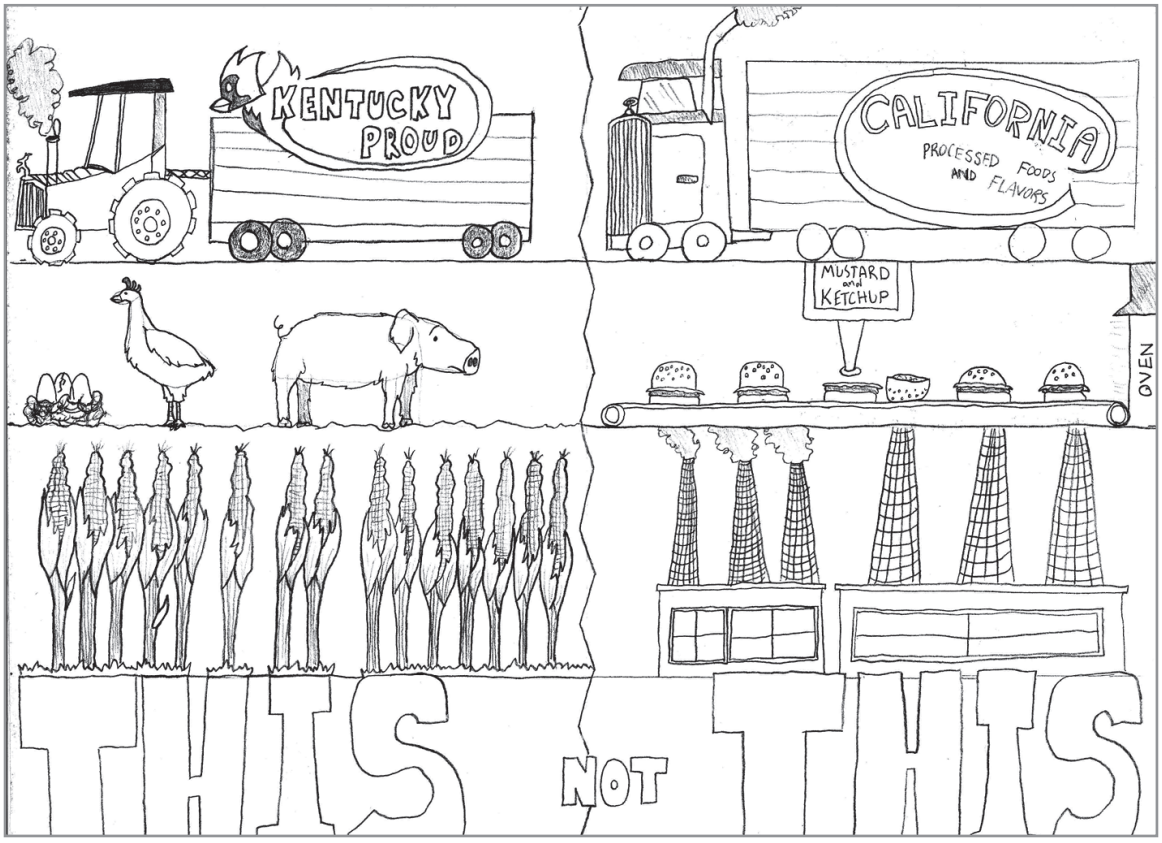
UNIVERSITY OF KENTUCKY College of Agriculture

KENTUCKY FARM TO SCHOOL PROGRAM

KENTUCKY FARM 2 SCHOOL

PRE-LESSON

MATERIALS



Jonathan Brad Praria, 6th grade, Woodford County Middle School

KENTUCKY FARM 2 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.

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KENTUCKY FARM 2 SCHOOL

Curriculum Table of Contents

KENTUCKY FARM 2 SCHOOL

Curriculum Overview

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.

KENTUCKY FARM 2 SCHOOL

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?

References

Centers for Disease Control and Prevention (n.d.). Overweight and obesity. Retrieved from **http://www.cdc.gov/obesity/data/trends.html**

Gredler, M. E. (2005). Learning and instruction theory into practice. (5th ed.). Upper Saddle River, NJ, Columbus, OH: Pearson, Merrill Prentice Hall.

Piaget, J. (1973). To understand is to invent. (Viking Press ed.). New York, NY: Grossman Publishers. Retrieved from **http://unesdoc.unesco.org/images/0000/000061/006133eo.pdf**

United States Department of Agriculture Economic Research Center (2012). Interactive mapping applications. Retrieved from **http://maps.ers.usda.gov/**

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.
- 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.

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KENTUCKY FARM TO SCHOOL PROGRAM

KENTUCKY FARM 2 SCHOOL

PRE & POST EVALUATION

Ben Broods, 6th grade, Woodford County Middle School

UNIVERSITY OF KENTUCKY College of Agriculture

PRE & POST EVALUATION

KENTUCKY FARM 2 SCHOOL

Pre & Post Test Evaluation/Assesment

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

	GRAINS	FRUITS	VEGETABLES	DAIRY	PROTEINS	OILS
TOTAL NUMBER OF SERVINGS (Consumed by class taught)						
TOTAL NUMBER OF KENTUCKY PROUD SERVINGS (Consumed by class taught)						
TOTAL NUMBER OF FOODS SOURCED (Consumed by class taught)						

PRE & POST EVALUATION

KENTUCKY FARM 2 SCHOOL

Post-curriculum evaluation results from Focus on Food & Farming, activity 8-1

	GRAINS	FRUITS	VEGETABLES	DAIRY	PROTEINS	OILS
TOTAL NUMBER OF SERVINGS (Consumed by class taught)						
TOTAL NUMBER OF KENTUCKY PROUD SERVINGS (Consumed by class taught)						
TOTAL NUMBER OF FOODS SOURCED (Consumed by class taught)						

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? _____

PRE & POST EVALUATION

KENTUCKY FARM 2 SCHOOL

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? _____

Kentucky Proud.

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PRE & POST EVALUATION

KENTUCKY FARM 2 SCHOOL

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: _____

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LESSON 1

INTRODUCTION

Elizabeth Cameron, 6th grade, Rockcastle County Middle School

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 1 FACILITATOR GUIDE

KENTUCKY FARM 2 SCHOOL

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
   - **https://www.choosemyplate.gov/SuperTracker/createprofile.aspx**
   - 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
   - **https://www.choosemyplate.gov/SuperTracker/createprofile.aspx**
   - 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

- (Optional: SuperTracker, Create Your Profile) **https://www.choosemyplate.gov/SuperTracker/createprofile.aspx**
- Activity sheet 1-3- Create a Serving Size Kit, along with listed supplies
- Activity sheet 1-4 – Hometown City Activity
- Calculator *(optional)*
- Activity sheet 1-5 – What's a Farmer to Do?
- Activity sheet 1-6 – Making a Kentucky Menu!
- 10 Reasons to Buy Local Foods **http://www.kyagr.com/consumer/documents/FT%20POSTER8-11.pdf**

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)

Bureau of Labor Statistics **http://www.bls.gov/K12/nature03.htm** (addresses the profession of Farming)

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

USDA Blog **http://blogs.usda.gov/2011/01/19/mapping-the-food-environment/**

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.

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

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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 9-10: Lesson 1 Introducing Kentucky Farm 2 School	
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.9-10.7. 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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 11-12: Lesson 1 Introducing Farm 2 School	
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

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Know your local farmers and what they do for you

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What is the definition of a consumer product?

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Consumer Products?

Generally any tangible personal property for sale that is used for personal, family, or household non-business purposes.

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Focus on Foods

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Farming, How Hard Could It Be?

KENTUCKY FARM 2 SCHOOL

Created by

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Jackie Walters
University of Kentucky Cooperative Extension Nutrition Education Program

Tina Garland
Kentucky Department of Agriculture

UNIVERSITY OF KENTUCKY College of Agriculture

What Do Farmers Have to Do with It? Consumer Products

KENTUCKY FARM 2 SCHOOL

Agricultural Content of Common Household Consumer Products

CONSUMER PRODUCT	AGRICULTURAL INGREDIENTS
Adhesives	Citrus oils, soybeans, chicken feathers, pork, beef
Antifreeze	Pork
Asphalt	Beef
Automobiles	Soybeans (lubricants, plastics, tires, foam)
Batteries	Corn starch
Bed linens and table linens	Cotton, linen
Bone china	Pork, beef
Bookbinding	Corn starch
Candles	Beef
Ceiling tile	Corn starch
Chalk	Corn Starch, pork
Clothing	Cotton, linen, wool, leather, silk, goose down
Crayons	Corn Starch, beef
Disposable diapers	Corn starch
Dyes	Corn Starch, pork
Food	Grains, fruits, vegetables, meats, vegetable oils, dairy products
Fuel filters, water filters	Corn starch, pork
Health and beauty products	Vegetable and fruit oils, minerals, flowers, herbs, corn starch, beef
Household cleaners and polishes	Citrus oils, beef
Inks	Soybeans
Insecticide	Beef
Insulation	Pork
Lubricants	Soybeans
Makeup	Vegetable oils, minerals, flowers, fish scales, corn starch, beef

KENTUCKY FARM 2 SCHOOL

Matches	Pork
Medications	Corn starch, pork
Paint and Coatings	Vegetable oils, beef
Pesticides	Citrus oils
Photographic film	Beef
Pillows and comforters	Goose down
Plastics	Soybeans, chicken feathers, beef
Rubber, tires	Corn starch
Shoes and boots	Leather
Shoe polish	Corn syrup
Soap	Vegetable and animal fat
Stain removers	Citrus oils
Towels	Cotton
Upholstery	Pork

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UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 1 | ACTIVITY SHEET 1-2

KENTUCKY FARM 2 SCHOOL

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.

KENTUCKY FARM 2 SCHOOL

FOOD EATEN & SERVING SIZE	IDENTIFY THE MYPLATE GROUP. *Grain, vegetable, fruit, dairy, protein*	DID YOU SOURCE THIS FOOD ITEM?	PRODUCED BY A KENTUCKY FARMER KENTUCKY PROUD YES/NO
BREAKFAST			
LUNCH			
DINNER			
SNACKS			
OILS			
DISCRETIONARY CALORIES			
COMPLETE ACTIVITY SHEET TOTALS ON NEXT PAGE.			

KENTUCKY FARM 2 SCHOOL

	GRAINS	FRUITS	VEGETABLES	DAIRY	PROTEINS	OILS
TOTAL NUMBER OF SERVINGS						
TOTAL NUMBER OF KENTUCKY PROUD SERVINGS						
TOTAL NUMBER OF FOODS SOURCED						

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

NEP-201C

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

Food Group	Recommended Amount	Amount Eaten	Difference
Fruits			
Vegetables			
Grains			
Protein			
Dairy			
Oils			
Empty Calories Limit			

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*

Males			
Age	Activity level		
	Sedentary[1]	Mod.active[2]	Active[3]
2	1000	1000	1000
3	1200	1400	1400
4	1200	1400	1600
5	1200	1400	1600
6	1400	1600	1800
7	1400	1600	1800
8	1400	1600	2000
9	1600	1800	2000
10	1600	1800	2200
11	1600	2000	2200
12	1800	2200	2400
13	2000	2200	2600
14	2000	2400	2800
15	2200	2600	3000
16-18	2400	2800	3200
19-24	2600	2800	3000
25	2600	2800	3000
26-28	2400	2800	3000
29-30	2400	2600	3000
31-32	2400	2600	3000
33-37	2400	2600	3000
38-46	2400	2600	2800
47-49	2200	2600	2800
50-52	2200	2400	2800
53-57	2200	2400	2800
58-60	2200	2400	2600
61-67	2200	2400	2600
68-69	2000	2400	2600
70-78	2000	2200	2600
79 —	2000	2200	2400

Females			
Age	Activity level		
	Sedentary[1]	Mod.active[2]	Active[3]
2	1000	1000	1000
3	1000	1200	1400
4	1200	1400	1400
5	1200	1400	1600
6	1200	1400	1600
7	1200	1600	1800
8	1400	1600	1800
9	1600	1600	1800
10	1600	1800	2000
11	1600	1800	2000
12	1600	2000	2200
13	1600	2000	2200
14	1800	2000	2400
15	1800	2000	2400
16-18	1800	2000	2400
19-24	2000	2200	2400
25	1800	2200	2400
26-28	1800	2200	2400
29-30	1800	2200	2400
31-32	1800	2000	2400
33-37	1800	2000	2200
38-46	1800	2000	2200
47-49	1800	2000	2200
50-52	1800	2000	2200
53-57	1600	2000	2200
58-60	1600	1800	2200
61-67	1600	1800	2000
68-69	1600	1800	2000
70-78	1600	1800	2000
79 —	1600	1800	2000

* Calorie levels are based on the Estimated Energy Requirements (EER) and activity levels from the U.S. Department of Agriculture. ChooseMyPlate.gov website at http://www.choosemyplate.gov/supertracker-tools/daily-food-plans.html. Accessed December 21, 2011.

[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

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

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

Calorie Level	Dark green vegetables	Orange vegetables	Dry Beans and Peas	Starchy vegetables	Other vegetables
1,000	0.5 c/wk	2.5 c/wk	0.5 c/wk	2 c/wk	1.5 c/wk
1,200	1 c/wk	3 c/wk	0.5 c/wk	3.5 c/wk	2.5 c/wk
1,400	1 c/wk	3 c/wk	0.5 c/wk	3.5 c/wk	2.5 c/wk
1,600	1.5 c/wk	4 c/wk	1 c/wk	4 c/wk	3.5 c/wk
1,800	1.5 c/wk	5.5 c/wk	1.5 c/wk	5 c/wk	4 c/wk
2,000	1.5 c/wk	5.5 c/wk	1.5 c/wk	5 c/wk	4 c/wk
2,200	2 c/wk	6 c/wk	2 c/wk	6 c/wk	5 c/wk
2,400	2 c/wk	6 c/wk	2 c/wk	6 c/wk	5 c/wk
2,600	2.5 c/wk	7 c/wk	2.5 c/wk	7 c/wk	5.5 c/wk
2,800	2.5 c/wk	7 c/wk	2.5 c/wk	7 c/wk	5.5 c/wk
3,000	2.5 c/wk	7.5 c/wk	3 c/wk	8 c/wk	7 c/wk
3,200	2.5 c/wk	7.5 c/wk	3 c/wk	8 c/wk	7 c/wk

Written by Jackie Walters, MBA, RD, LD, Extension Associate for Nutrition Education Programs

MyPlate Food Intake Pattern Calorie Levels" chart and "MyPlate Daily Amount of Food From Each Group" charts adapted from http://www.choosemyplate.gov for use in Kentucky by Jackie Walters, MBA, RD, LD, Extension Specialist for Nutrition Education Programs

Revised 1-2012

KENTUCKY FARM 2 SCHOOL

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

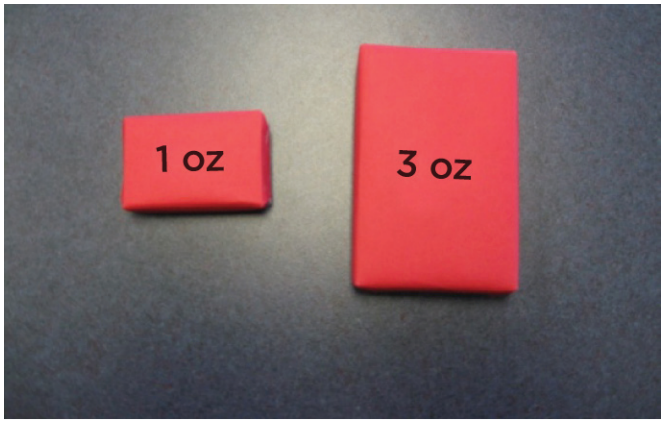
Optional:

- 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.

KENTUCKY FARM 2 SCHOOL



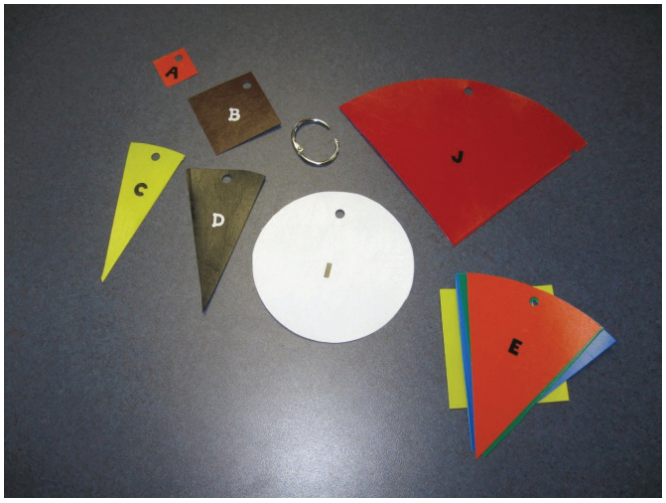
Wrap a deck of cards in colored paper and secure it with clear tape. Label it, "3 Ounces." Wrap a matchbox in colored paper and secure it with scotch tape. Label it, "1 Ounce."

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.

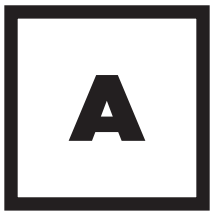


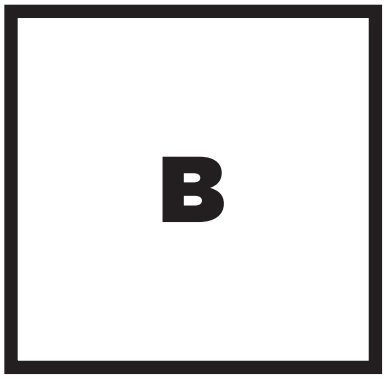
KENTUCKY FARM 2 SCHOOL

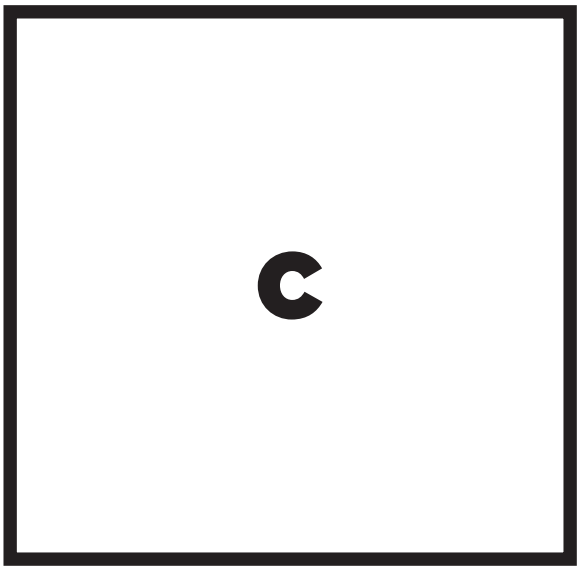
Patterns for Portion Kit

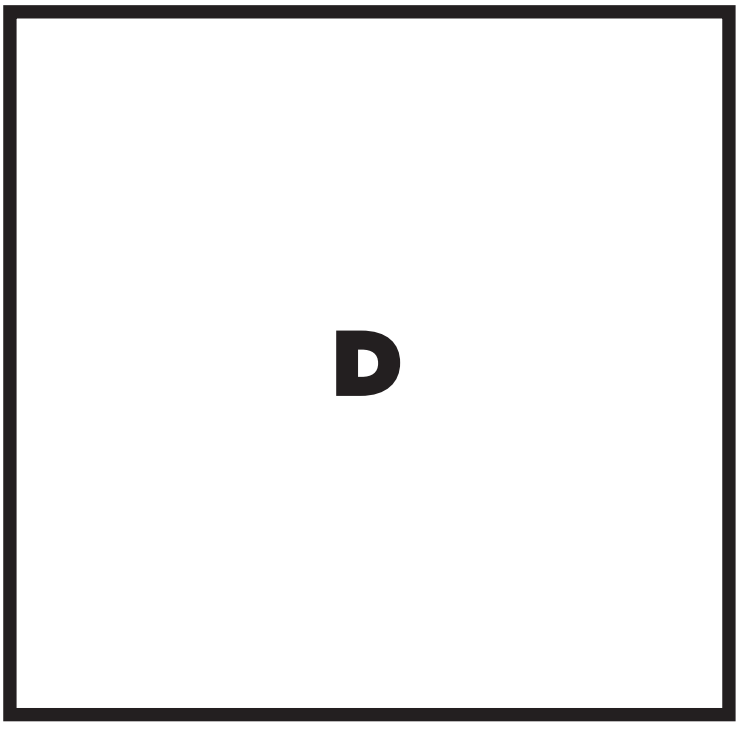
KEY TO FOOD RECALL KIT SAMPLES

	Example to measure
A. 1" square	1" cube cheese
B. 2" square	brownies
C. 3" square	1/9 of a 9" sheet cake
D. 4"square	¼ of an 8" square cake
E. 1/16 of a layer cake	cake
F. 1/12 of a layer cake	cake
G. 1/8 of a 9"pie	pie, quiche
H. 1/6 of a 9" pie	pie, quiche
I. 4" circle	danish, pancake
J. 6" circle	large pancake
K. ¼ of 12" pizza	pizza







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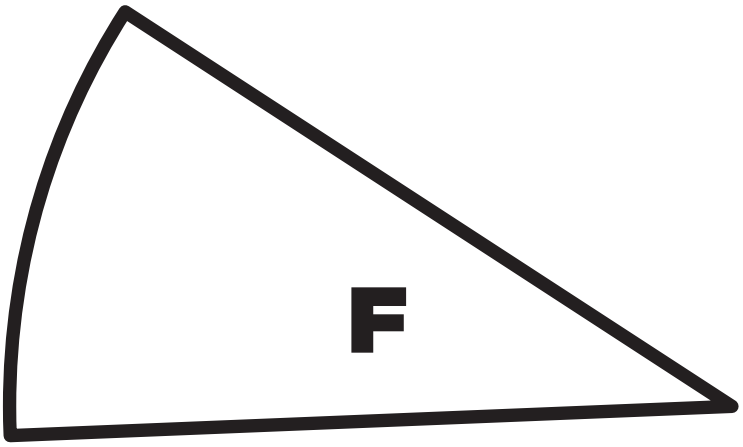
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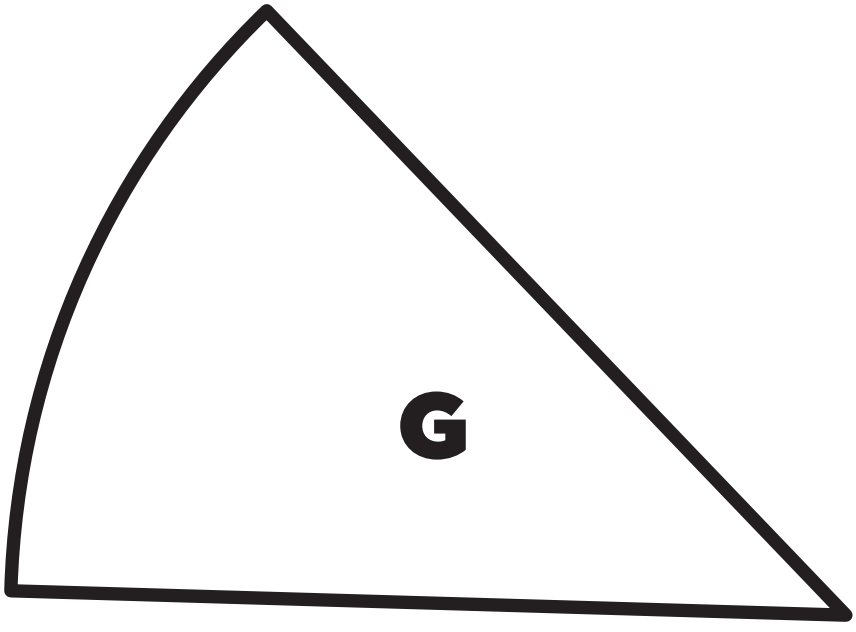
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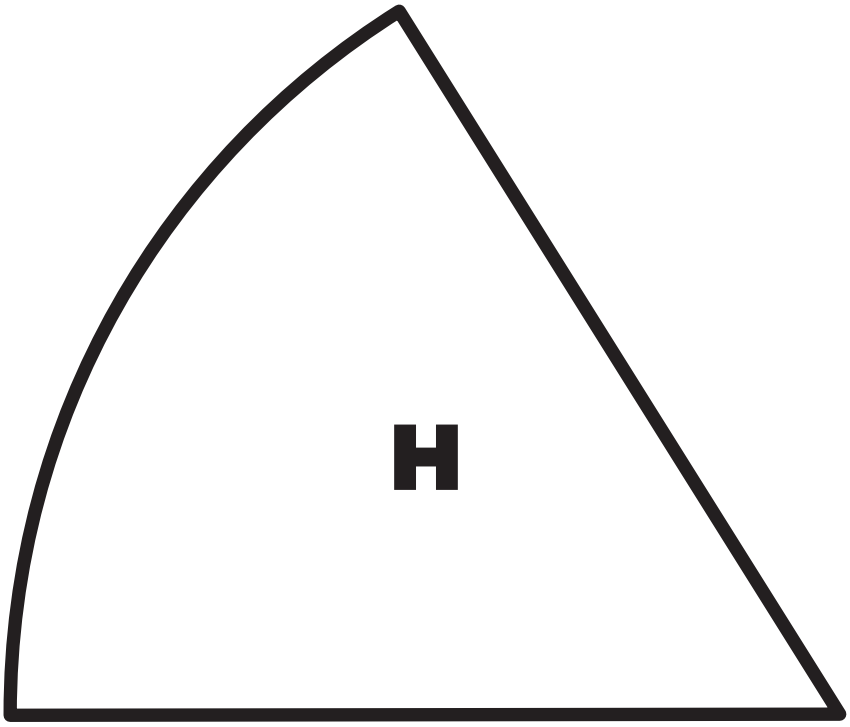
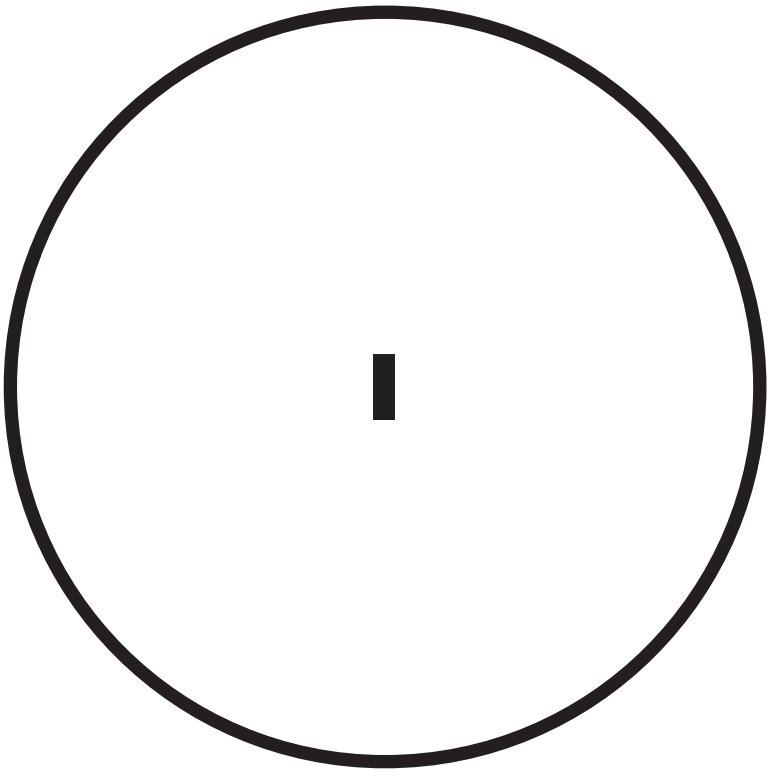
KENTUCKY FARM 2 SCHOOL





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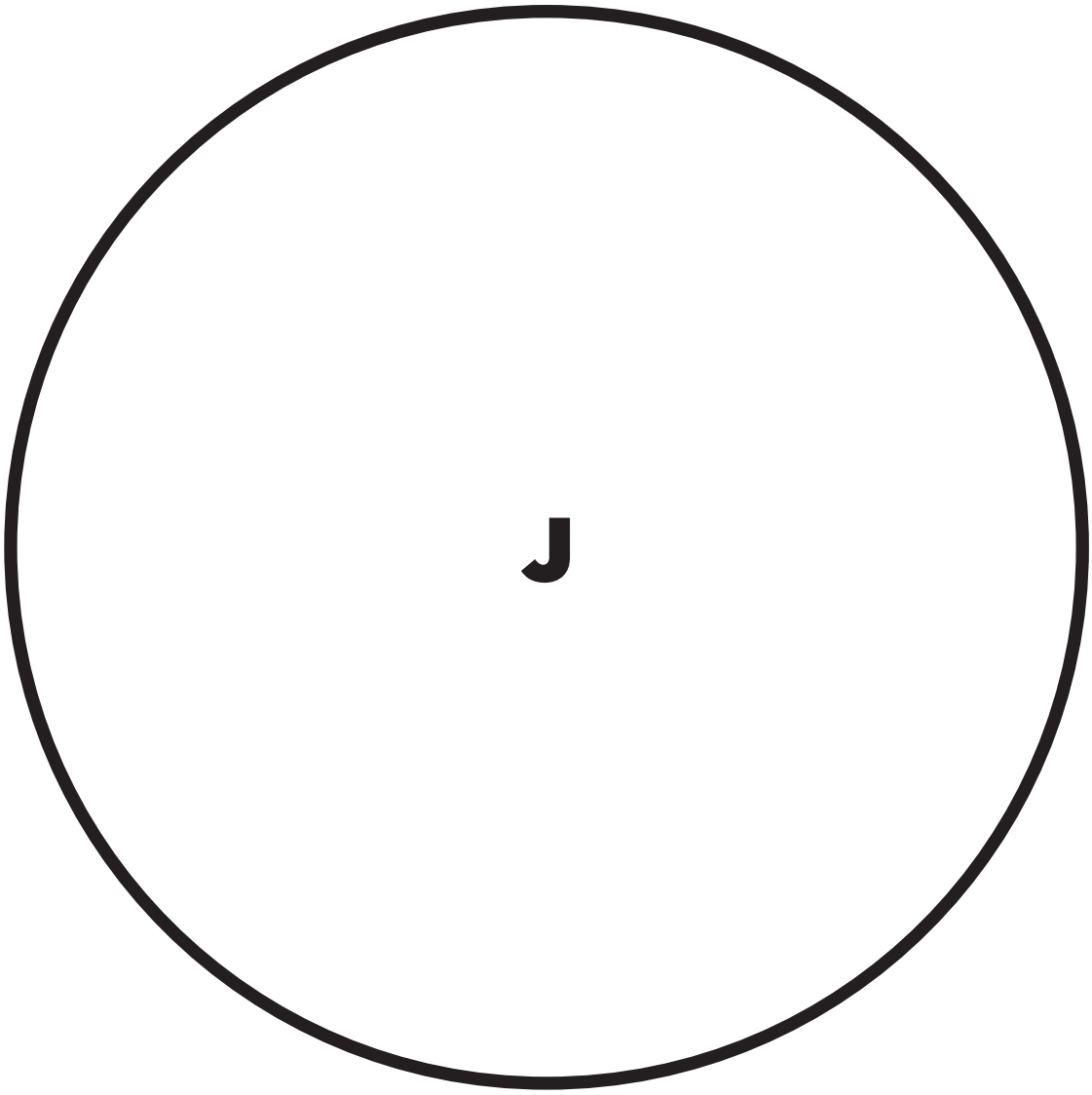

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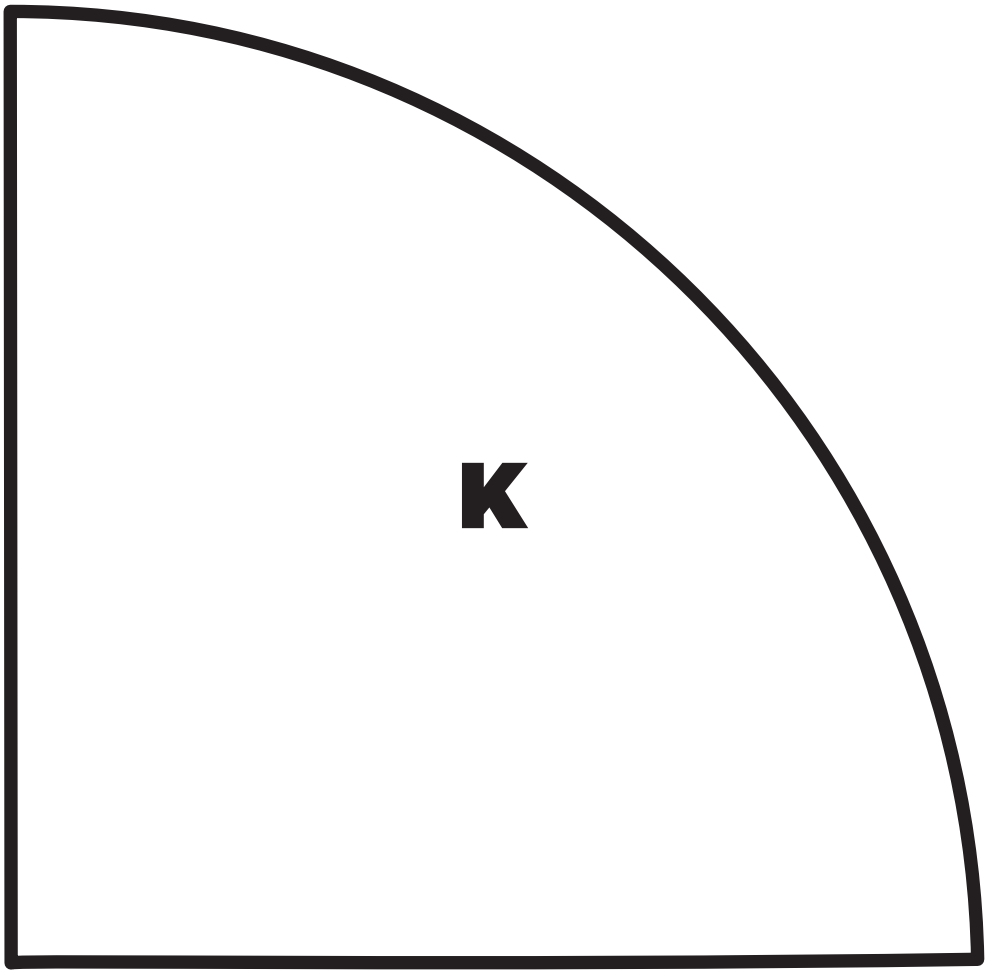

KENTUCKY FARM 2 SCHOOL

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:

School board	$100,000
Grocery store	$50,000
Restaurant, sit down	$10,000
Restaurant, fast food	$12,000
Caterer	$2,000
Shoe store	$25,000
Book store	$25,000
Drug store	$40,000
Movie theatre	$30,000
Clothing store	$30,000
Hotel	$50,000
City government	$100,000
Hardware/appliance store	$40,000
Church	$35,000
Roller skating rink	$35,000
Factory	$90,000
Gas station/convenience store	$25,000
Dairy farmer	$2,000
Beef cattle farmer	$2,000
Vegetable farmer	$2,000
Teacher	$2,000
Grocery store worker	$900
Waitress	$500
Shoe store clerk	$1,000
Book store clerk	$1,000
Pharmacist	$3,000
Medical doctor	$4,000
Dentist	$3,500
Gas station attendant	$500
Factory worker	$1,000
Bank	$100,000
TOTAL:	**$822,400**

KENTUCKY FARM 2 SCHOOL

Complete the following transactions in order, balancing the checkbook as you go. Record of Transactions, may be used to track payments and deposits.

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:

$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

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 $40,000 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:

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.

Transaction 7:

The dentist wants a new pair of shoes for the conference. He purchases a $120 pair of shoes from the shoe store.

Transaction 8:

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.

Transaction 9:

The caterer spends $200 at the grocery store on food for the party.

KENTUCKY FARM 2 SCHOOL

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.)

KENTUCKY FARM 2 SCHOOL

Answer Key Part 1

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

School board	$92,130
Grocery store	$10,760
Restaurant, sit down	$9,920
Restaurant, fast food	$11,840
Caterer	$2,260
Shoe store	$24,620
Book store	$24,570
Drug store	$39,225
Movie theatre	$29,460
Clothing store	$29,700
Hotel	$60,000
City government	$113,748
Hardware/appliance store	$39,200
Church	$35,085
Roller skating rink	$34,300
Factory	$88,200
Gas station/convenience store	$24,900
Dairy farmer	$1,815
Beef cattle farmer	$1,815
Vegetable farmer	$1,830
Teacher	$1,815
Grocery store worker	$752
Waitress	$355
Shoe store clerk	$840
Book store clerk	$850
Pharmacist	$2,800
Medical doctor	$3,790
Dentist	$2,680
Gas station attendant	$355
Factory worker	$840
Bank	$98,000
TOTAL:	**$788,455**

KENTUCKY FARM 2 SCHOOL

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.

KENTUCKY FARM 2 SCHOOL

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.)

KENTUCKY FARM 2 SCHOOL

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?

KENTUCKY FARM 2 SCHOOL

Answer Key Part 2

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

School board	$92,130
Grocery store	$11,110
Restaurant, sit down	$9,955
Restaurant, fast food	$11,840
Caterer	$3,130
Shoe store	$24,620
Book store	$24,595
Drug store	$39,240
Movie theatre	$29,475
Clothing store	$30,150
Hotel	$60,000
City government	$113,748
Hardware/appliance store	$50,200
Church	$35,125
Roller skating rink	$34,540
Factory	$88,200
Gas station/convenience store	$25,195
Dairy farmer	$62,440
Beef cattle farmer	$11,205
Vegetable farmer	$14,970
Teacher	$1,675
Grocery store worker	$752
Waitress	$550
Shoe store clerk	$880
Book store clerk	$850
Pharmacist	$2,660
Medical doctor	$3,655
Dentist	$1,180
Gas station attendant	$5,350
Factory worker	$835
Bank	$99,000
TOTAL:	**$889,255**

Hometown City Activity Sheet

Community Member/Entity	Beginning Funds	T 1	T 2	T 3	T 4	T 5	T 6	T 7	T 8	T 9	T 10	T 11	Balance
School board	100,000												
Grocery store	50,000												
Restaurant, sit down	10,000												
Restaurant, fast food	12,000												
Caterer	2,000												
Shoe store	25,000												
Book store	25,000												
Drug store	40,000												
Movie theater	30,000												
Clothing store	30,000												
Hotel	50,000												
City government	100,000												
Hardware/Appliance Store	40,000												
Church	35,000												
Roller skating rink	35,000												
Factory	90,000												
Store	25,000												
Dairy farmer	2,000												
Beef cattle farmer	2,000												
Vegetable famer	2,000												
Teacher	2,000												
Grocery store worker	900												
Waitress	500												
Shoe store clerk	1,000												
Book store clerk	1,000												
Pharmacist	3,000												
Medical doctor	4,000												
Dentist	3,500												
Gas station attendent	500												
Factory worker	1,000												
Bank	100,000												
Total	822,400												

Hometown City Activity Sheet Key

Community Member/Entity	Beginning Funds	T 1	T 2	T 3	T 4	T 5	T 6a	T 6b	T 7	T 8	T 9	T 10	T 11	T 12	T 13	T 14	T 15	T 16	T 17	Ending Balance
School board	100,000	2,000	6,000	130																92,130
Grocery store	50,000	1,000			40,000	1,560							550							11,110
Restaurant, sit down	10,000	200															120	35		9,955
Restaurant, fast food	12,000	240															80			11,840
Caterer	2,000	40											1,250	80						3,130
Shoe store	25,000	500									120	80		80						24,620
Book store	25,000	500													25		70			24,595
Drug store	40,000	800													15		25			39,240
Movie theater	30,000	600													15		60			29,475
Clothing store	30,000	600												405	45		300			30,150
Hotel	50,000	1,000								11,000										60,000
City government	100,000	13,748																		113,748
Hardware/Appliance Store	40,000	800							11,000											50,200
Church	35,000																		125	35,125
Roller skating rink	35,000	700																		34,540
Factory	90,000	1,800																		88,200
Gas Station/Convenience	25,000	500														295	400			25,195
Dairy farmer	2,000	40	1,000	10	8,000	120	70,000	2,800	16,000	500						70			20	62,440
Beef cattle farmer	2,000	40	1,000	10	7,000	120				1,500						105			20	11,205
Vegetable famer	2,000	40	1,500	10	10,000	120				2,000					240	120				14,970
Teacher	2,000	40		10		120								135					20	1,675
Grocery store worker	900	18		10		120														752
Waitress	500	10		10		120							200						10	550
Shoe store clerk	1,000	20		10		120						80						35	15	880
Book store clerk	1,000	20		10		120														850
Pharmacist	3,000	60		10		120								135					15	2,660
Medical doctor	4,000	80		10		120								135						3,655
Dentist	3,500	70		10		120					120		2,000							1,180
Gas station attendent	500	10		10		120			5,000										10	5,350
Factory worker	1,000	20		10		120													15	835
Bank	100,000	2,000					70,000	71,000												99,000
Total	822,400																			889,255

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 1 **ACTIVITY SHEET 1-4**

KENTUCKY FARM 2 SCHOOL

Record of Transactions

NAME _____

DATE	TRANSACTION DESCRIPTION	PAYMENT AMOUNT	DEPOSIT AMOUNT	BALANCE
	Starting Balance			

KENTUCKY FARM 2 SCHOOL

DATE	TRANSACTION DESCRIPTION	PAYMENT AMOUNT	DEPOSIT AMOUNT	BALANCE

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 1 **ACTIVITY SHEET 1-5**

KENTUCKY FARM 2 SCHOOL

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

KENTUCKY FARM 2 SCHOOL

Recommended Resources

Vegetables:

Bell Pepper **http://www.uky.edu/Ag/NewCrops/introsheets/pepperintro.pdf**

Sweet Corn **http://www.uky.edu/Ag/CDBREC/introsheets/sweetcorn.pdf**

Vegetable Production Guide for Commercial Growers 2012-13 **http://www.ca.uky.edu/agc/pubs/id/id36/id36.pdf**

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

Pumpkin **http://www.uky.edu/Ag/CDBREC/introsheets/pumpkinintro.pdf**

State Soy Crop Statistics **http://soystats.com/2010/page_14.htm**

Specialty Soybeans **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**

Iowa State University Soybean Extension and Research Program **http://extension.agron.iastate.edu/soybean/production_planting.html**

NDSU Soybean Production **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** (insect pests)

Barley Resources **www.extension.org/article/32488**

USDA New Feed Grains Data **www.ers.usda.gov/data/feedgrains/Table.asp?t=01**

University of California Cooperative Extension: 2009 Sample Cost to Produce Grain Sorghum **http://www.coststudies.ucdavis.edu/files/SorghumGrainVS2009.pdf**

Fruit:

Orchard Pesticides **http://www.ca.uky.edu/agc/pubs/id/id93/ch_6.pdf**

Apples **http://www.uky.edu/Ag/CDBREC/introsheets/apples.pdf**

General Orchard Management **http://www.ca.uky.edu/agc/pubs/id/id93/ch_7.pdf**

Livestock:

Profitable Poultry **http://sare.org/publications/poultry/poultry.pdf**

Avian Health KDA **www.kyagr.com/statevet/poultry/index.htm**

Organic and Grass-finished Beef Cattle Production **http://attra.ncat.org/attra-pub/summaries/cattleprod.html**

Penn State Extension: Ag Alternatives **http://agalternatives.aers.psu.edu/Publications/feeding_beef_cattle.pdf**

Determining Cost of Production is Useful to Cattle Producers **http://www.noble.org/Ag/Economics/CostOfProduction/index.htm**

UK Agricultural Situation & Outlook Fall 2009 **www.ca.uky.edu/cmspubsclass/files/swilliamson/group/09esmPubFinal.pdf**

E-extension Horse **www.extension.org/horses**

E-extension Goat **www.extension.org/goat**

USDA Agricultural Marketing Service **http://www.ams.usda.gov/AMSv1.0/**

Purdue Animal Science Managing Internal Parasitism in Sheep and Goats **www.extension.org/mediawiki/files/8/8a/purdue_parasite_control.pdf**

E-extension Dairy **www.extension.org/dairy**

University of Minnesota Extension Feeding the Dairy Herd **www.extension.umn.edu/distribution/livestocksystems/di0469.html**

E-extension Swine **www.extension.org/swine**

Marketing:

Agricultural Marketing Resource Center **http://www.agmrc.org/business_development/operating_a_business/direct_marketing/articles/pricing_for_profit.com**

UK Ag News **http://www.ca.uky.edu/news/?c=n&d=766**

USDA Fruit and Vegetable Market News **http://marketnews.usda.gov/portal/fv**

USDA Market News and Transportation Data **http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateA&page=FVMarketNews**

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.

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LESSON 1 **ACTIVITY SHEET 1-6**

KENTUCKY FARM 2 SCHOOL

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
http://www.kyproud.com/prodsearch.aspx

Kentucky Proud Market
http://www.kentuckyproudmarket.com/

KENTUCKY FARM 2 SCHOOL

Rubric

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

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

Kentucky Proud.

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UNIVERSITY OF KENTUCKY
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KENTUCKY FARM 2 SCHOOL

LESSON 2

GRAINS

Jesse Day, 6th grade, Rockcastle County Middle School

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 2 FACILITATOR GUIDE

KENTUCKY FARM 2 SCHOOL

Facilitator Guide

Lesson 2: The Grains of Your Community

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:

- A Comprehensive Guide to Wheat Management in Kentucky, **http://www.ca.uky.edu/agc/pubs/id/id125/id125.htm**
- 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**
- U.S. Farmer, **http://www.usfarmer.com/equipment/index.php**
- 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?.

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/tiTHRSHSNG;ttTHRSHSNG.html**

Bell Institute of Health and Nutrition **http://www.bellinstitute.com/Whole_Grain.aspx**

Story of Farming **http://www.historylink101.com/lessons/farm-city/story-of-farming.htm**

References:

Colley, M., Stone, A., & Brewer, L. (2010). *Organic seed processing: threshing, cleaning and storage.* Retrieved from **http://www.extension.org/pages/18350/organic-seed-processing:-threshing-cleaning-and-storage**

History Source LLC. (2011). *Story of farming: reaping.* Retrieved from **http://www.historylink101.com/lessons/farm-city/reaping.htm**

KENTUCKY FARM 2 SCHOOL

Kentucky Farm 2 School Grades 9-10: Lesson 2 The Grains of Your Community	
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.9-10.7. 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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 11-12: Lesson 2 Grains of Your Community	
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

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 2 **ACTIVITY SHEET 2-1**

KENTUCKY FARM 2 SCHOOL

A Grain of Great Proportion

	Column A	Column B	Column C
Your Favorite Grain Food	**Your Serving Size** (ounce equivalents)	**MyPlate Serving Size** (ounce equivalents)	**What's The Difference?** Your serving size minus MyPlate serving size **A-B=C**
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 _____

_____

_____

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 2 **HANDOUT 2-1**

KENTUCKY FARM 2 SCHOOL

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

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LESSON 2 HANDOUT 2-2

KENTUCKY FARM 2 SCHOOL

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.

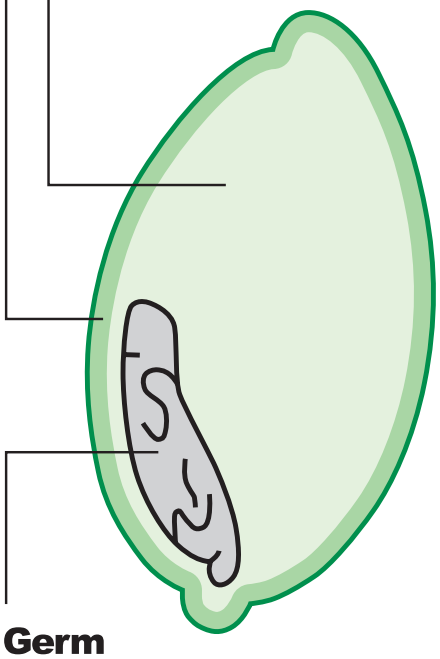
Where can information be found if you want to be sure you are getting whole-grain foods?

- 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?

Whole grain kernel

Bran
"Outer shell" protects seed
(Fiber, B vitamins, trace minerals)

Endosperm
Provides energy
(Carbohydrates, protein)



Germ
Nourishment for the seed
(Antioxidants, vitamin E, B-vitamins)

KENTUCKY FARM 2 SCHOOL

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.

UNIVERSITY OF KENTUCKY
College of Agriculture

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

KENTUCKY FARM 2 SCHOOL

Make Half Your Grains Whole

COOPERATIVE EXTENSION SERVICE
UK UNIVERSITY OF KENTUCKY College of Agriculture

The average American consumes 7 to14 grams of fiber daily.

How much do you need?

AGE	MALE	FEMALE
1- 3 years	19 g	19 g
4 - 8 years	25 g	25 g
9 -13 years	31 g	26 g
14 - 50 years	38 g	25 g
51+ years	31 g	21 g
Pregnancy		28 g

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.

KENTUCKY FARM 2 SCHOOL

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?

KENTUCKY FARM 2 SCHOOL

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.

Nutrition Facts

Serving Size 1 Slice (28g)
Servings Per Container 20

Calories 80
Calories from Fat 10

Amount/Serving	% Daily Value*
Total Fat 1g	1%
Saturated Fat 0g	0%
Trans Fat 0g	
Polyunsaturated Fat 0.5g	
Monounsaturated Fat 0g	
Cholesterol 0mg	0%

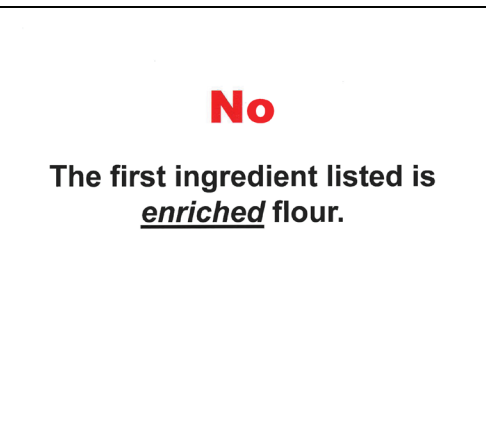
Amount/Serving	% Daily Value*
Sodium 140mg	6%
Total Carbohydrate 14g	5%
Dietary Fiber Less than 1g	4%
Sugars 3g	
Protein 3g	

Vitamin A 0% • Vitamin C 0% • Calcium 2% • Iron 4%
Thiamin 8% • Riboflavin 4% • Niacin 6% • Folic Acid 8%

INGREDIENTS: ENRICHED BLEACHED FLOUR (WHEAT FLOUR, MALTED BARLEY FLOUR, NIACIN, IRON, THIAMIN MONONITRATE (VITAMIN B1), RIBOFLAVIN (VITAMIN B2), FOLIC ACID), WATER, HIGH FRUCTOSE CORN SYRUP, WHOLE WHEAT FLOUR, CONTAINS 2% OR LESS OF EACH OF THE FOLLOWING: BROWN SUGAR, VEGETABLE OIL (SOYBEAN AND/OR COTTONSEED OIL), SALT, DOUGH CONDITIONERS (MONO AND DIGLYCERIDES, ETHOXYLATED MONO AND DIGLYCERIDES, SODIUM STEAROYL LACTYLATE, CALCIUM PEROXIDE, DATEM, ASCORBIC ACID, AZODICARBONAMIDE, ENZYMES), YEAST NUTRIENTS (CORN STARCH, CALCIUM PROPIONATE (PRESERVATIVE), SOY LECITHIN, SOY FLOUR. CONTAINS WHEAT AND SOY.

236658

SARA LEE FOOD & BEVERAGE, A DIVISION OF SARA LEE CORPORATION, DOWNERS GROVE, IL 60515 USA



No

The first ingredient listed is *enriched* flour.

KENTUCKY FARM 2 SCHOOL

Yes

The first ingredient listed is *whole wheat flour*.

KENTUCKY FARM 2 SCHOOL

INGREDIENTS:
WHOLE WHITE WHEAT FLOUR, WATER, VITAL WHEAT GLUTEN, HIGH FRUCTOSE CORN SYRUP, YEAST…

Vitamin A 0% • Vitamin C 0%
Calcium 4% • Iron 4%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

INGREDIENTS: WHOLE WHITE WHEAT FLOUR (WHEAT FLOUR, MALTED BARLEY FLOUR), WATER, VITAL WHEAT GLUTEN, HIGH FRUCTOSE CORN SYRUP, YEAST, CONTAINS 2% OR LESS OF SOYBEAN OIL, SALT, SOY FLOUR, VINEGAR, SODIUM STEAROYL LACTYLATE, ETHOXYLATED MONOGLYCERIDE, SUCRALOSE, CALCIUM PROPIONATE (PRESERVATIVE), CALCIUM SULFATE, MONOCALCIUM PHOSPHATE, AMMONIUM SULFATE, ASCORBIC ACID, AZODICARBONAMIDE, ENZYMES.
CONTAINS: WHEAT AND SOY.
DISTRIBUTED BY THE KROGER CO., CINCINNATI, OHIO 45202

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.*

* American Institute for Cancer Research, http://www.aicr.org, January, 2007.

Are these cereals good sources of whole grain?

INGREDIENTS:
WHEAT FARINA…

Vitamin A 0%	•	Vitamin C 0%	
Calcium 20%	•	Iron	50%
Thiamin 10%	•	Riboflavin	4%
Niacin 6%	•	Folic Acid	10%

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

		Calories:	2,000	2,500
Total Fat	Less than		65g	80g
Sat Fat	Less than		20g	25g
Cholest	Less than		300mg	300mg
Sodium	Less than		2,400mg	2,400mg
Total Carb			300g	375g
Fiber			25g	30g

INGREDIENTS: WHEAT FARINA, PARTIALLY DEFATTED WHEAT GERM, DISODIUM PHOSPHATE (FOR QUICK COOKING).
VITAMINS AND MINERALS: CALCIUM

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.

INGREDIENTS:
WHOLE GRAIN ROLLED OATS

Calcium			2%
Iron			10%

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

		2,000	2,500
Total Fat	Less than	65g	80g
Sat. Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

INGREDIENTS: WHOLE GRAIN ROLLED OATS.
DISTRIBUTED BY THE KROGER CO.
CINCINNATI, OH 45202.

KENTUCKY FARM 2 SCHOOL

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…

Vitamin D	0%	10%
Thiamin	25%	25%
Niacin	25%	25%
Vitamin B_6	25%	25%
Folate	25%	25%
Vitamin B_{12}	25%	35%

*Amount in cereal. One half cup skim milk contributes an additional 40 calories, less than 5mg cholesterol, 65mg sodium, 6g total carbohydrate (6g sugars), and 4g protein.
**Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

INGREDIENTS: RICE, SUGAR, CORN MEAL, ALMOND PIECES, HONEY, SALT, CALCIUM CARBONATE, BARLEY MALT EXTRACT, BROWN SUGAR MOLASSES, CARAMEL COLOR, NATURAL AND ARTIFICIAL FLAVOR, SODIUM ASCORBATE, REDUCED IRON, NIACINAMIDE, THIAMIN MONONITRATE, PYRIDOXINE HYDROCHLORIDE, FOLIC ACID, VITAMIN B12.
TO MAINTAIN QUALITY, BHT HAS BEEN ADDED TO THIS PACKAGE.
CONTAINS ALMOND.

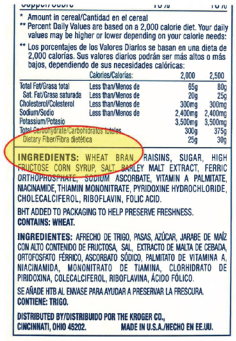
KENTUCKY FARM 2 SCHOOL

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.

INGREDIENTS: WHEAT BRAN, RAISINS, SUGAR, HIGH FRUCTOSE CORN SYRUP…



* Amount in cereal/Cantidad en el cereal
** Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:
** Los porcentajes de los Valores Diarios se basan en una dieta de 2,000 calorías. Sus valores diarios podrán ser más altos o más bajos, dependiendo de sus necesidades calóricas:

Calories/Calorías:		2,000	2,500
Total Fat/Grasa total	Less than/Menos de	65g	80g
Sat. Fat/Grasa saturada	Less than/Menos de	20g	25g
Cholesterol/Colesterol	Less than/Menos de	300mg	300mg
Sodium/Sodio	Less than/Menos de	2,400mg	2,400mg
Potassium/Potasio		3,500mg	3,500mg
Total Carbohydrate/Carbohidratos totales		300g	375g
Dietary Fiber/Fibra dietética		25g	30g

INGREDIENTS: WHEAT BRAN, RAISINS, SUGAR, HIGH FRUCTOSE CORN SYRUP, SALT, BARLEY MALT EXTRACT, FERRIC ORTHOPHOSPHATE, SODIUM ASCORBATE, VITAMIN A PALMITATE, NIACINAMIDE, THIAMIN MONONITRATE, PYRIDOXINE HYDROCHLORIDE, CHOLECALCIFEROL, RIBOFLAVIN, FOLIC ACID.

BHT ADDED TO PACKAGING TO HELP PRESERVE FRESHNESS.
CONTAINS: WHEAT.

INGREDIENTES: AFRECHO DE TRIGO, PASAS, AZÚCAR, JARABE DE MAÍZ CON ALTO CONTENIDO DE FRUCTOSA, SAL, EXTRACTO DE MALTA DE CEBADA, ORTOFOSFATO FÉRRICO, ASCORBATO SÓDICO, PALMITATO DE VITAMINA A, NIACINAMIDA, MONONITRATO DE TIAMINA, CLORHIDRATO DE PIRIDOXINA, COLECALCIFEROL, RIBOFLAVINA, ÁCIDO FÓLICO.

SE AÑADE HTB AL ENVASE PARA AYUDAR A PRESERVAR LA FRESCURA.
CONTIENE: TRIGO.

DISTRIBUTED BY/DISTRIBUIDO POR THE KROGER CO., CINCINNATI, OHIO 45202. MADE IN U.S.A./HECHO EN EE.UU.

KENTUCKY FARM 2 SCHOOL

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

Are the following products good sources of whole grain?

INGREDIENTS:
PRECOOKED LONG GRAIN WHITE RICE ENRICHED WITH FERRIC ORTHOPHOSPHATE (IRON)…

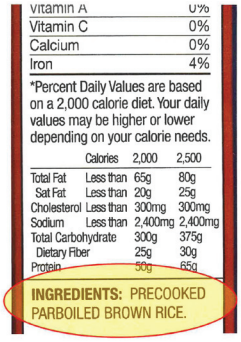
No

The first ingredient listed is enriched rice, rather than brown (whole grain) rice.

This rice provides less than 1 gram of fiber.

KENTUCKY FARM 2 SCHOOL

INGREDIENTS:
Precooked
parboiled
brown rice



Vitamin A	0%
Vitamin C	0%
Calcium	0%
Iron	4%

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

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Protein		50g	65g

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.

INGREDIENTS:
100% DURUM
WHOLE
WHEAT FLOUR

Sodium 0mg**			**0%**
Total Carbohydrate 41g			**14%**
Dietary Fiber 6g			**24%**
Sugars 2g			
Protein 7g			
Vitamin A 0% • Vitamin C 0%			
Calcium 0% • Iron 10%			

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

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

INGREDIENTS: 100% DURUM WHOLE WHEAT FLOUR.
CONTAINS: WHEAT
**WITHOUT ADDED SALT IN COOKING WATER.

Yes

ted is

The only ingredient lis whole wheat flour.

sta
etary

One serving of this pa provides 6 grams of di fiber.

INGREDIENTS:
DURUM WHOLE WHEAT FLOUR AND SEMOLINA FLOUR

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.

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 2 **ACTIVITY SHEET 2-2**

KENTUCKY FARM 2 SCHOOL

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 FARM 2 SCHOOL

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**

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**

US Farmer, **http://www.usfarmer.com/equipment/index.php**

Kentucky Department of Agriculture, **http://www.kyagr.com/**

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LESSON 2 **HANDOUT 2-3**

KENTUCKY FARM 2 SCHOOL

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)

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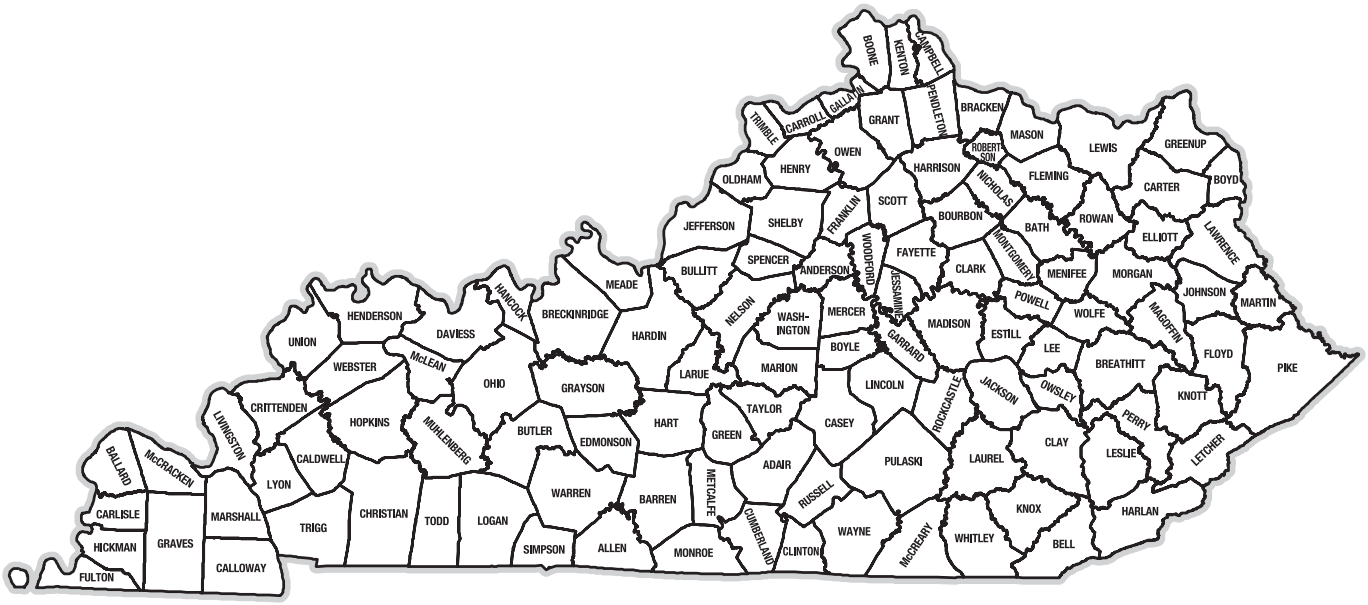
LESSON 2 **ACTIVITY SHEET 2-4**

KENTUCKY FARM 2 SCHOOL

Kentucky Counties



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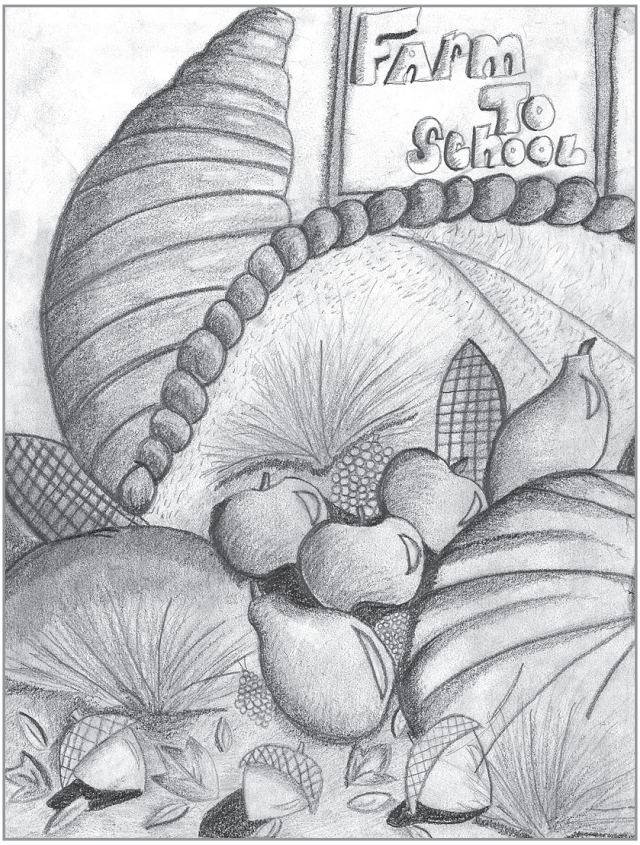
KENTUCKY FARM 2 SCHOOL

LESSON 3

VEGGIES



Jalinda Fead, 8th grade, Woodford County Middle School

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 3 FACILITATOR GUIDE

KENTUCKY FARM 2 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
   - Activity 3
   - Activity 4
   - Activity sheet 3-1
   - Activity 5
   - Activity 6
   - Activity sheet 3-2

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**

• Activity sheet 3-1 Surviving Kentucky in the 1700's

• Portion Size Kit or activity sheet 1-3 *(from lesson 1)*

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.

Eggplant	Kohlrabi
Carrots	Peppers
Brussels sprouts	Cucumbers
Okra	Onions
Cauliflower	Potatoes
Squash	Sweet potatoes
Beets	Radishes
Asparagus	Cabbage
Beans	Broccoli
Leafy greens	Lettuce
Peas	Zucchini
Corn	Pumpkins
Tomatoes	Turnips
Red peppers	Sorghum

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.

Corn	Seed
Celery	Stem
Cabbage	Leaf
Potatoes	Root
Cauliflower	Flower
Peas	Seed
Tomato	Fruit
Asparagus	Stem
Carrot	Root
Spinach	Leaf
Kale	Leaf
Broccoli	Flower
Onions	Root

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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 9-10: Lesson 3 Farm Fresh Veggies	
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.9-10.7. 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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 11-12: Lesson 3 Farm Fresh Veggies	
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

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LESSON 3 **HANDOUT 3-1**

KENTUCKY FARM 2 SCHOOL

Vegetables Subcategory Chart

Type of Vegetable	Nutrients Found in Vegetable Group
Dark green vegetables (broccoli, collard greens, spinach)	Vitamin A, Vitamin C, B Vitamins, Iron, Calcium
Orange vegetables carrots, sweet potatoes, winter squash	Vitamin A
Dried Beans, Peas, & Legumes (beans, peas, lentils, soybeans, peanuts)	Protein, Folate, Potassium, Iron and Magnesium
Starchy vegetables (potatoes, corn, lima beans)	B Vitamins

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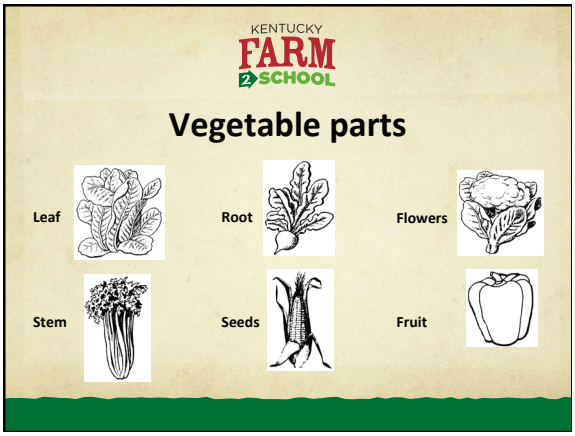
LESSON 3 **HANDOUT 3-2**

KENTUCKY FARM 2 SCHOOL

Vegetable Parts

Leaf	lettuce, cabbage, spinach, mustard greens
Stem	asparagus, celery
Root	radish, beet, carrot, potato
Seeds	peas, corn
Flowers	cauliflower, broccoli
Fruit	squash, tomatoes, cucumber, eggplant, peppers

KENTUCKY FARM 2 SCHOOL

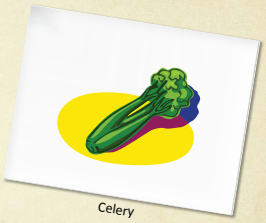


KENTUCKY FARM 2 SCHOOL

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit



Celery

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

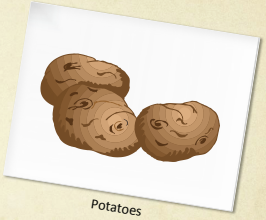
Leaf
Stem
Root
Seeds
Flower
Fruit

Cabbage

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit



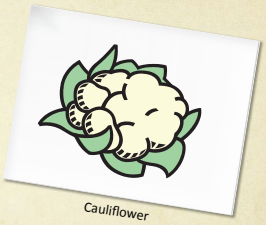
Potatoes

KENTUCKY FARM 2 SCHOOL

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

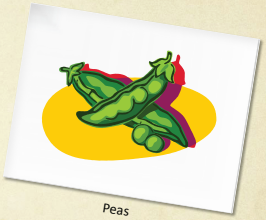


Cauliflower

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

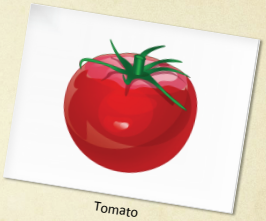


Peas

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit



Tomato

KENTUCKY FARM 2 SCHOOL

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

Asparagus

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

Carrots

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

Spinach

KENTUCKY FARM 2 SCHOOL

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

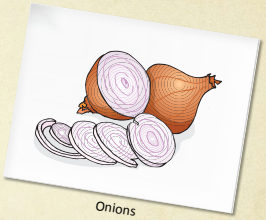
Leaf
Stem
Root
Seeds
Flower
Fruit

Broccoli

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit



Onions

KENTUCKY FARM 2 SCHOOL

Name the Vegetable Part

Leaf
Stem
Root
Seeds
Flower
Fruit

Kale

KENTUCKY FARM 2 SCHOOL

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LESSON 3 **ACTIVITY SHEET 3-1**

KENTUCKY FARM 2 SCHOOL

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.

Colorful Eating

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.

Get the blues (and purples)

Brain/memory, healthy aging, urinary tract

Fruits
- Blackberries
- Blueberries
- Grapes
- Plums

Vegetables
- Eggplant
- Kohlrabi
- Purple asparagus
- Purple cabbage
- Purple carrots
- Purple peppers

Great greens

Vision, bones, teeth

Fruits
- Apples
- Grapes
- Paw paws
- Pears

Vegetables
- Asparagus
- Beans
- Broccoli
- Brussel sprouts
- Cabbage
- Cucumbers
- Kohlrabi
- Leafy greens
- Lettuce
- Okra
- Onions (green)
- Peas
- Peppers
- Zucchini

Wonderful whites

Heart, maintain healthy cholesterol

Fruits
- Pears (brown)
- White peaches

Vegetables
- Cauliflower
- Kohlrabi
- Onions
- Potatoes
- White corn

Outstanding oranges (and yellows)

Vision, immune system, heart

Fruits
- Cantaloupe
- Peaches
- Yellow apples
- Yellow pears
- Yellow watermelon

Vegetables
- Carrots
- Corn
- Golden potatoes
- Peppers
- Pumpkins
- Squash
- Sweet potatoes
- Yellow tomatoes

Radiant reds

Heart, urinary tract, brain/memory

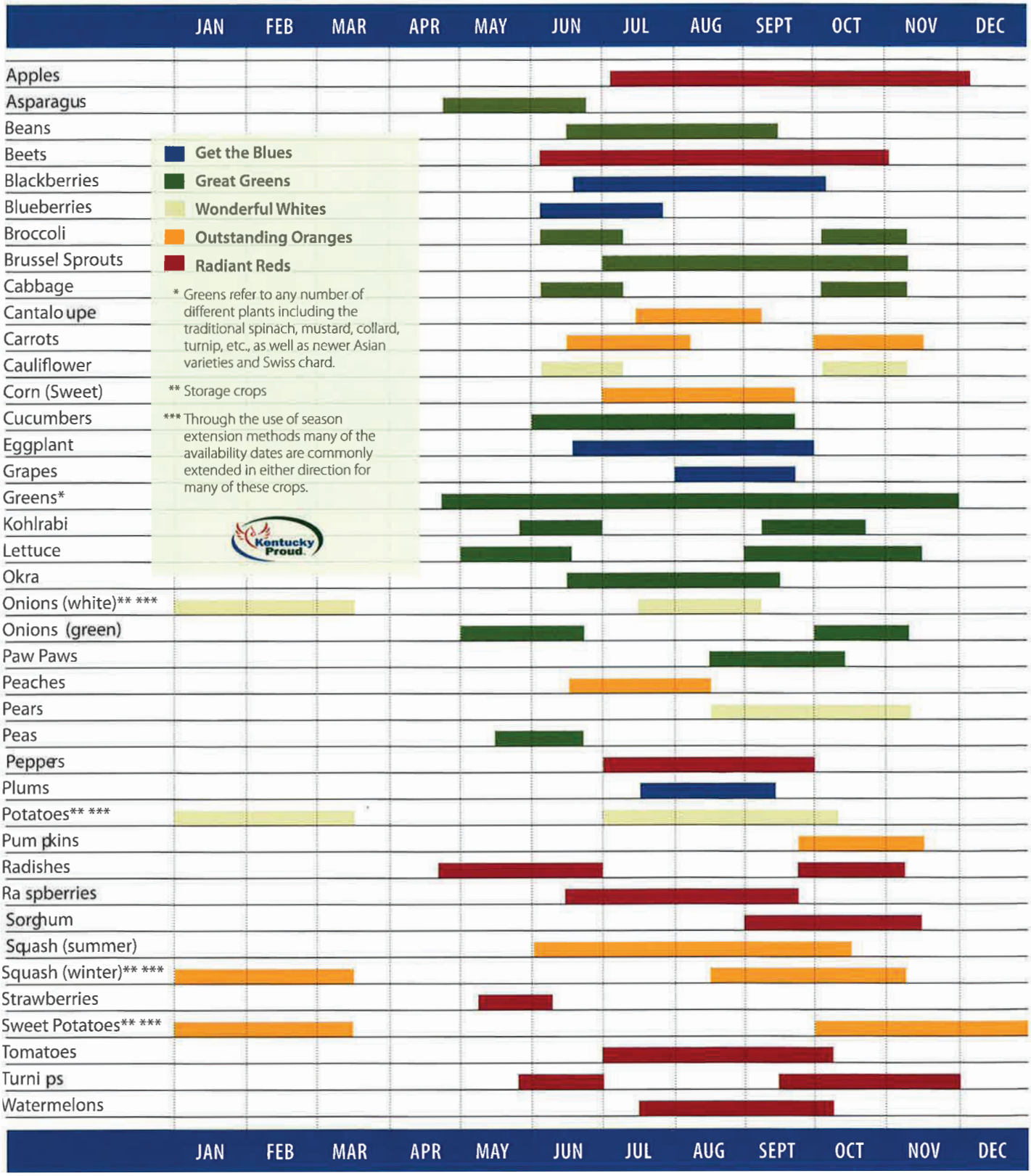
Fruits
- Apples
- Grapes
- Pears
- Raspberries
- Strawberries
- Watermelons

Vegetables
- Beers
- Radishes
- Red peppers
- Sorghum
- Tomatoes
- Turnips

Kentucky Proud.

Kentucky Proud Produce Availability

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."



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LESSON 3 **ACTIVITY SHEET 3-2**

KENTUCKY FARM 2 SCHOOL

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.

KENTUCKY FARM 2 SCHOOL

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:

Oliver, L. (2000). Colonial & early American fare. Retrieved from **http://www.foodtimeline.org/foodcolonial.html**

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LESSON 3 **HANDOUT 3-3**

KENTUCKY FARM 2 SCHOOL

World Map

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KENTUCKY FARM 2 SCHOOL

LESSON 4

FRUITS

Megan Taylor, 6th grade, Rockcastle County Middle School

KENTUCKY FARM 2 SCHOOL

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
   - Activity sheet 4-2
   - Activity 4
   - Activity sheet 4-3
   - Activity 5
   - Handout 4-3,
   - Forest Production of Pawpaw KSU Extension
   - American Persimmon UK Extension
   - Activity 6
   - Activity 7
   - Activity 8
   - Activity 9

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

- Handout 4-3 The Pawpaw and American Persimmons
- KSU Extension handout Forest Production of Pawpaw
- UK Extension handout American Persimmon
- Handout 4-6 Fruit Rollups from Home recipe
- Kentucky Strawberry Freezer Jam
- Handout 4-7 World Map

Lesson Initiation

Bell ringer/class opener:

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

Lesson Introduction

Review last lesson

(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.

(Script)

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**

How to use persimmons **http://www.davewilson.com/homegrown/promotion/persimmons.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**

Common Persimmons **http://plants.usda.gov/plantguide/pdf/pg_divi5.pdf**

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

The Pleasures of Persimmons **http://voices.washingtonpost.com/mighty-appetite/2008/11/the_pleasures_of_persimmons.html**

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:

Malcolm, P. A. . (2006, August 1). *The history of the pawpaw tree.* Retrieved from **http://www.bharatbhasha.com/gardening.php/46061**

Mitchell, T. (2005, September). *Vitamin-less vegetables.* Retrieved from **http://www.lef.org/magazine/mag2005/sep2005_report_veggies_01.htm**

Strang, J. (2008,). *American persimmons.* Retrieved from **http://www.uky.edu/Ag/CDBREC/introsheets/persimmon.pdf**

KENTUCKY FARM 2 SCHOOL

Kentucky Farm 2 School Grades 9-10: Lesson 4 Fruit From the Farm	
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.9-10.7. 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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 11-12: Lesson 4 Fruit From the Farm	
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

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LESSON 4 **HANDOUT 4-1**

KENTUCKY FARM 2 SCHOOL

Fruity Q & A

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?

_____

KENTUCKY FARM 2 SCHOOL

Fruity Q & A: Key

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)

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LESSON 4 **ACTIVITY SHEET 4-1**

KENTUCKY FARM 2 SCHOOL

Is Fresh Better?

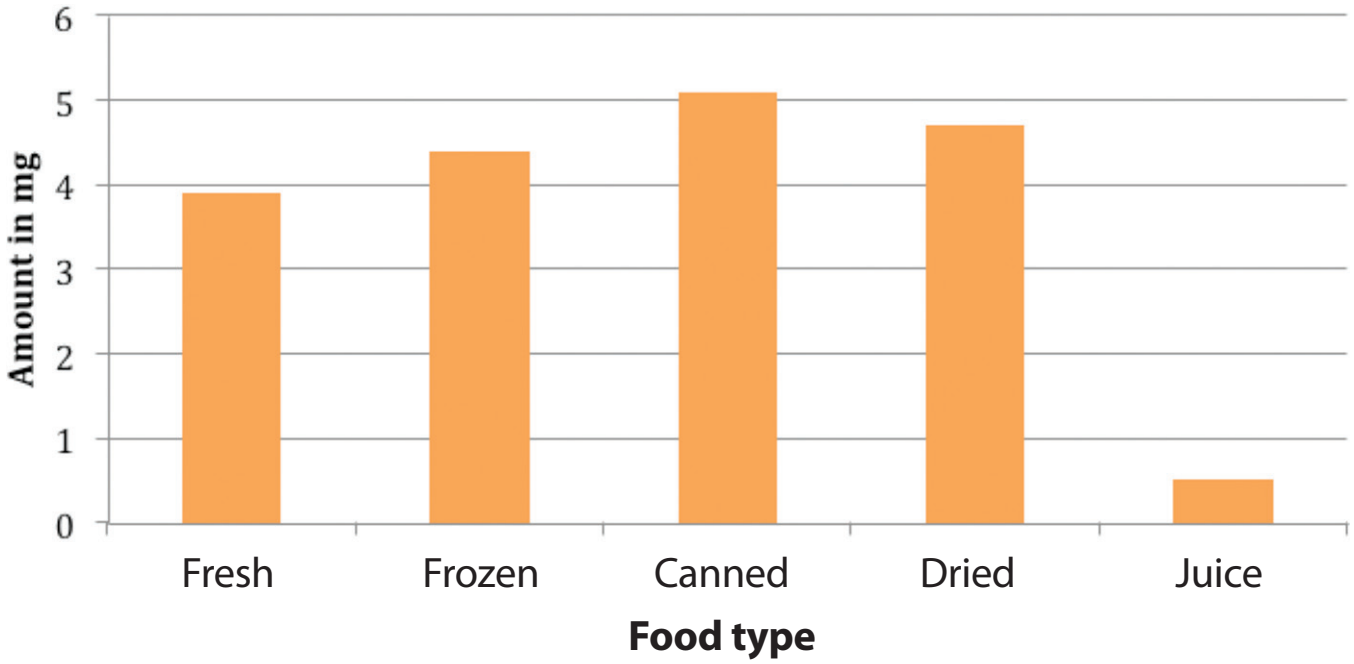
Type of fruit	Content of 1 cup fresh			Content of 1 cup frozen			Content of 1 cup Canned		
	Vit C	Vit A	Fiber	Vit C	Vit A	Fiber	Vit C	VIt A	FIber
Apples									
Blackberries									
Pears									
Strawberries									
Peaches									
Blueberries									
Average									

KENTUCKY FARM 2 SCHOOL

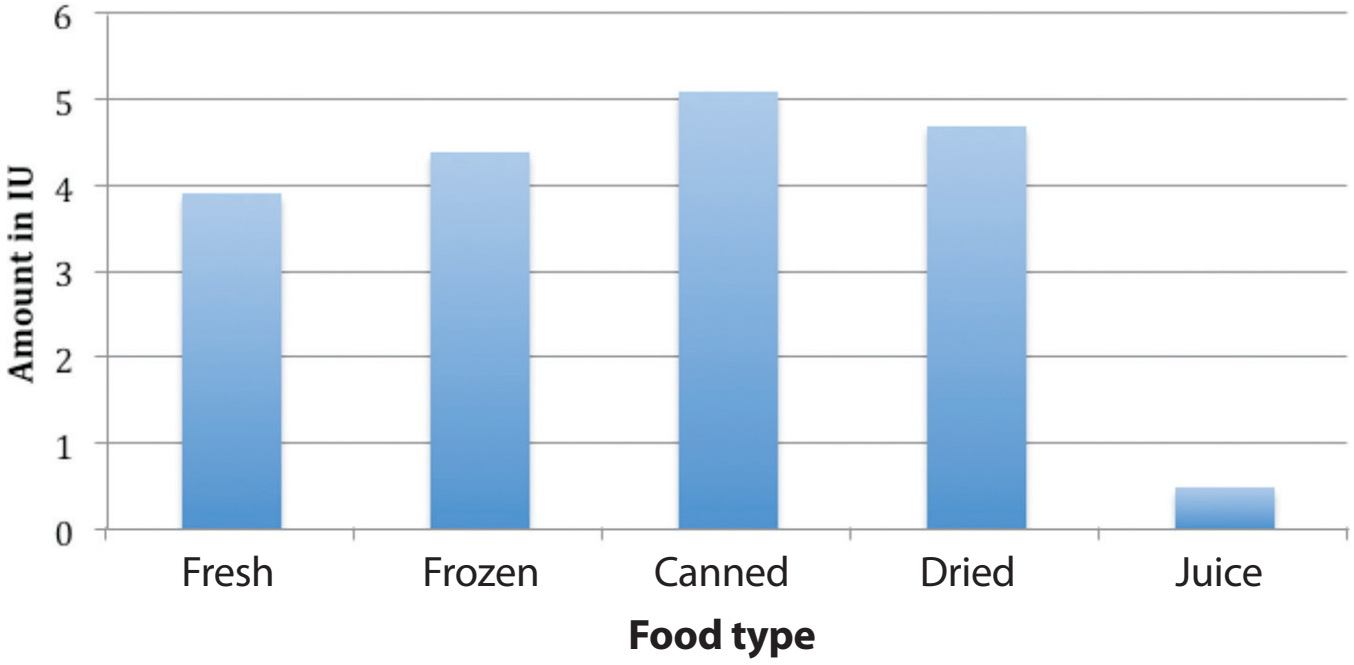
Type of fruit	Content of 1/2 cup Dried			Content of 1 cup Juice		
	Vitamin C	Vitamin A	Fiber	Vitamin C	Vitamin A	Fiber
Apples						
Blackberries						
Pears						
Strawberries						
Peaches						
Blueberries						
Average						

KENTUCKY FARM 2 SCHOOL

Vitamin C Content

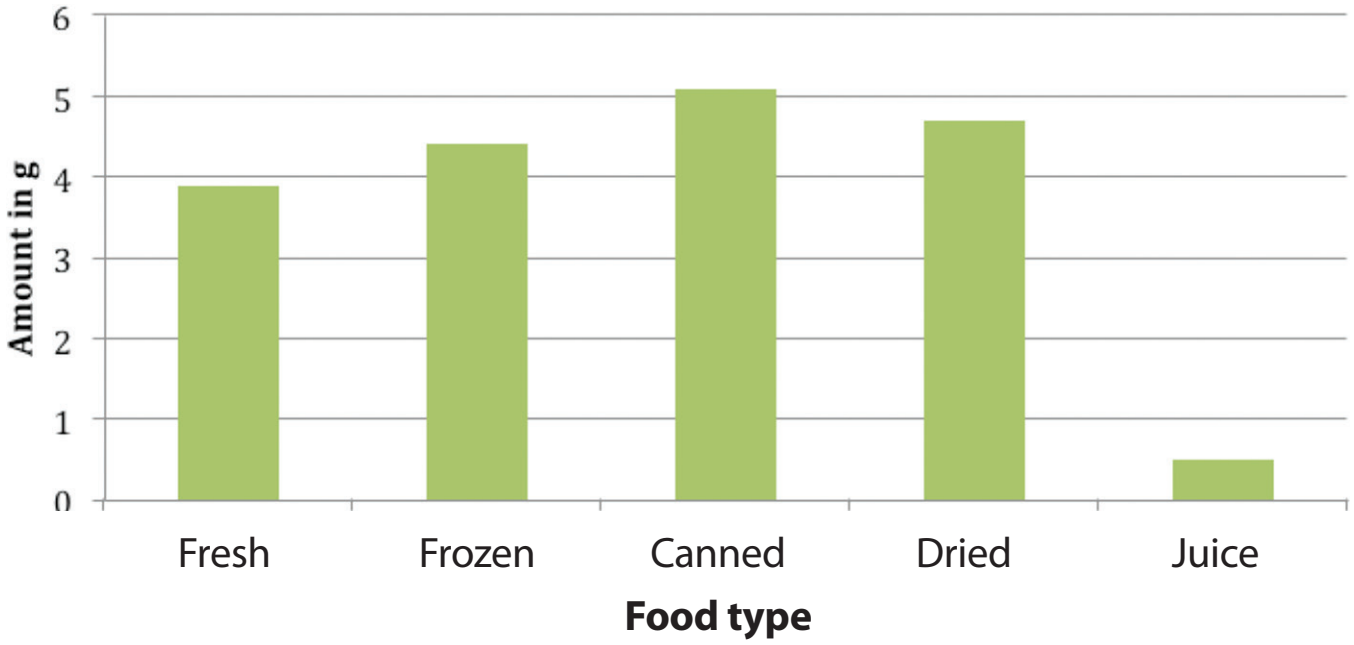


Content of Vitamin A



KENTUCKY FARM 2 SCHOOL

Fiber Content



KENTUCKY FARM 2 SCHOOL

Is Fresh Better! Teacher Key

Type of Fruit	Content of 1 cup fresh			Content of 1 cup frozen			Content of 1 cup canned		
	Vit C	Vit A	Fiber	Vit C	Vit A	Fiber	Vit C	Vit A	Fiber
Apples	5 mg	59 IU	2.6 g	o.8 mg	41 IU	2.7 g	0.4 mg	114 IU	4.1 g
Blackberries	30.2mg	308 IU	7.6 g	4.7 g	172 IU	7.5 g	7.2 mg	561 IU	8.7 g
Pears	5.9 mg	32 IU	4.3 g	N/A	N/A	N/A	1.8 mg	0 IU	4.0 g
Strawberries	89.4 mg	18 IU	3 g	61.4 mg	67 IU	3.1 g	80.5mg	66 IU	4.3 g
Peaches	10.2 mg	502 IU	2.3 g	235.5mg	710 IU	4.5 g	6.0 mg	889 IU	3.3 g
Blueberries	14.4mg	80 IU	3.6 g	3.9 mg	71 IU	4.2 g	1.2 mg	88 IU	6.3 g
AVERAGE	25.85 mg	166.5 UI	3.9 g	61.26 mg	212.2 IU	4.4 g	16.18 mg	286.3 IU	5.1 g

Type of Fruit	Content of ½ cup dried			Content of 1 cup juice		
	Vit C	Vit A	Fiber	Vit C	Vit A	Fiber
Apples	1.3 mg	22 IU	2.5g	2.2mg	2 IU	0.5g
Blackberries	N/A	N/A	N/A	N/A	N/A	N/A
Pears	5.1 mg	54 IU	8.2g	N/A	N/A	N/A
Strawberries	N/A	N/A	N/A	N/A	N/A	N/A
Peaches	4.8 mg	254 IU	3.5g	N/A	N/A	N/A
Blueberries	N/A	N/A	N/A	N/A	N/A	N/A
AVERAGE	3.7 mg	110 IU	4.7g	2.2mg	2 IU	0.5g

Source: http://www.nal.usda.gov/fnic/foodcomp/search/

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LESSON 4 **HANDOUT 4-2**

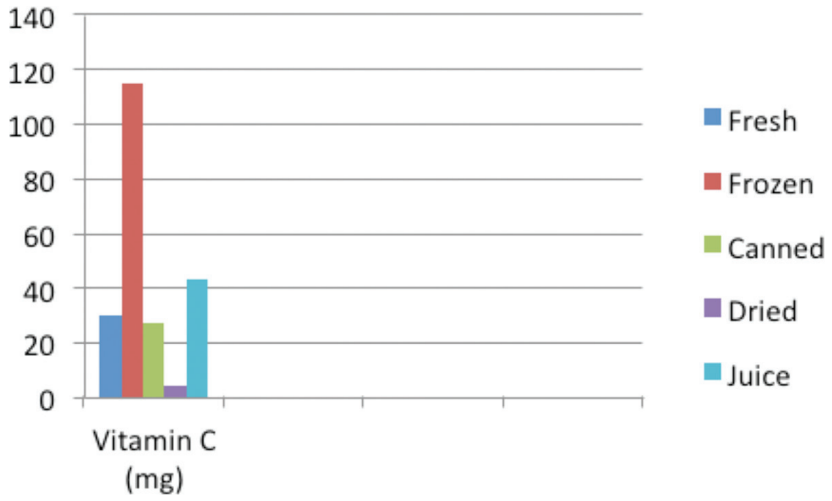
KENTUCKY FARM 2 SCHOOL

Nutrition Composition

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**) 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.)

Type of Fruit	**Vitamin C Content of 1 Cup Fresh**	**Vitamin C Content of 1 Cup Frozen**	**Vitamin C Content of 1 Cup Canned**	**Vitamin C Content of ½ Cup Dried**	**Vitamin C Content of 1 Cup Juice**
Apples	3 mg		4 mg	1 mg	2 mg
Apricots	10 mg		10mg	9.5 mg	8 mg
Blackberries	30 mg				
Blueberries	20 mg	2 mg			
Cantaloupes	63 mg				
Cherries	10 mg		12 mg		
Grapes	6 mg			2 mg	
Peaches	12 mg	236 mg	7 mg	6 mg	
Pears	7 mg		4 mg		
Strawberries	88 mg	106 mg			
Watermelons	15 mg				
AVERAGE	30.3 mg	115 mg	27	4.4	43.2

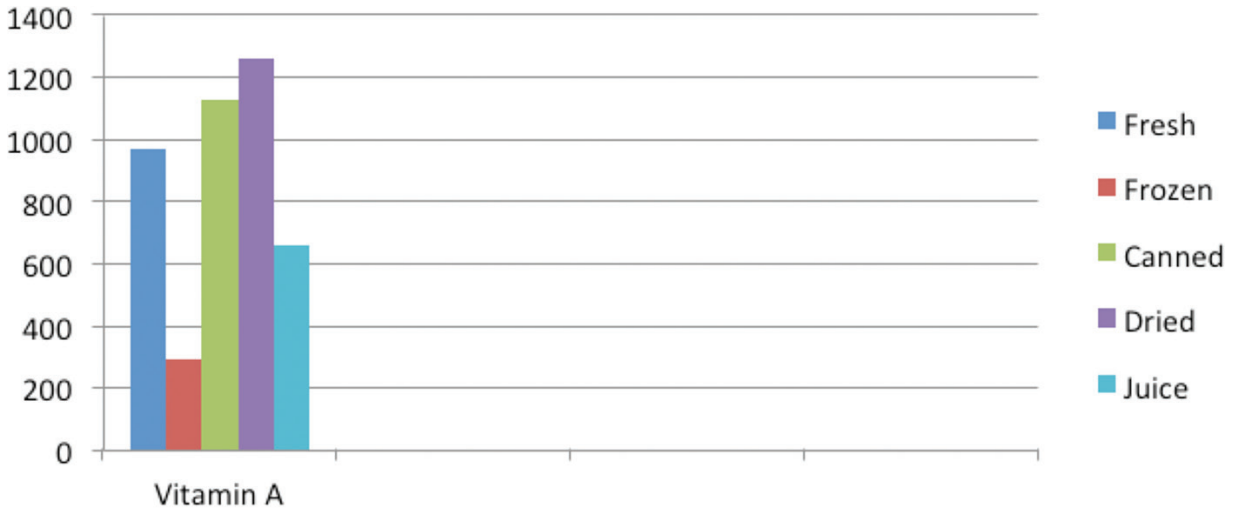
KENTUCKY FARM 2 SCHOOL



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.

Type of Fruit	**Vitamin A Content of 1 Cup Fresh**	**Vitamin A Content of 1 Cup Frozen**	**Vitamin A Content of 1 Cup Canned**	**Vitamin A Content of ½ Cup Dried**	**Vitamin A Content of 1 Cup Juice**
Apples	50 IU		0 mg	0 IU	
Apricots	3,303 IU		4,510 IU	4,275 IU	
Blackberries	290 IU				
Blueberries	140 IU	101 IU			
Cantaloupes	6,540 IU				
Cherries	584 IU		1,660 IU		
Grapes	140 IU		none	15 IU	
Peaches	2,230 IU	710 IU	1,100 IU	1,645 IU	
Pears	30 IU		trace		
Strawberries	90 IU	61 IU			
Watermelons	556 IU				
AVERAGE	970.2 IU	291 IU	1,131 IU	1,263 IU	658 IU

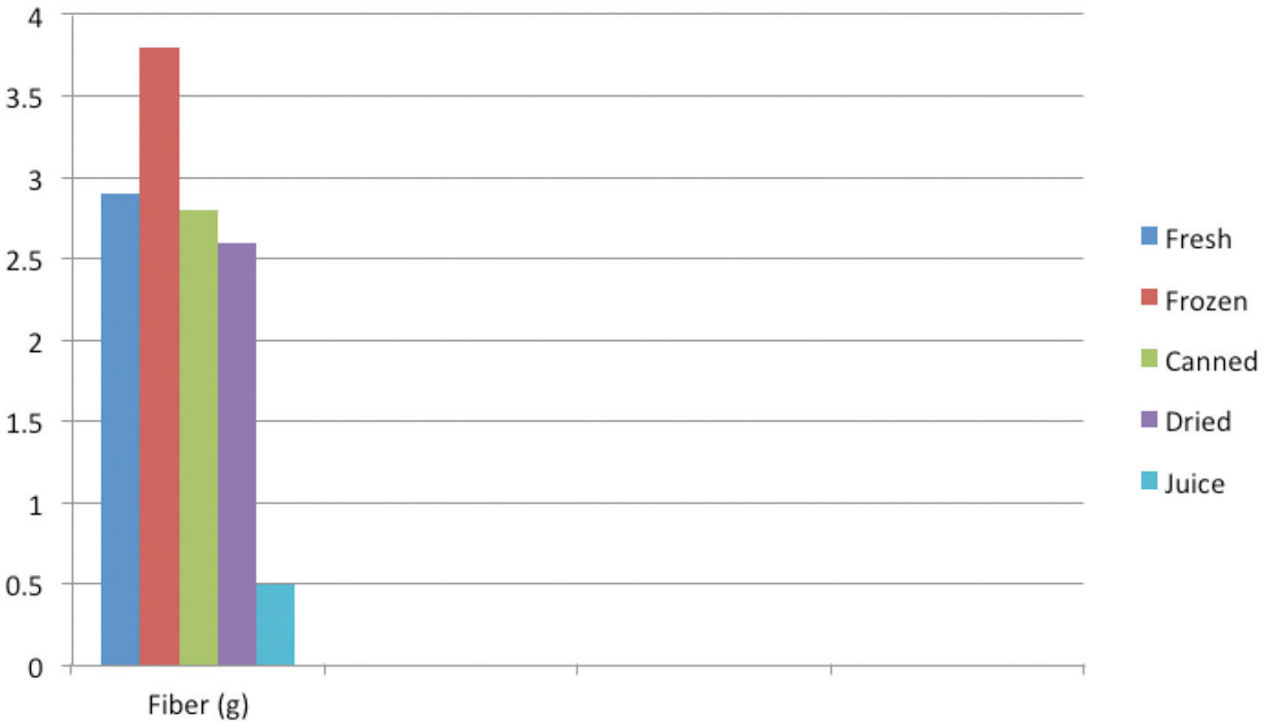
KENTUCKY FARM 2 SCHOOL



I.U. = International Units. International Units are the typical units of measurement for vitamin A.

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

KENTUCKY FARM 2 SCHOOL



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.

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LESSON 4 ACTIVITY SHEET 4-2

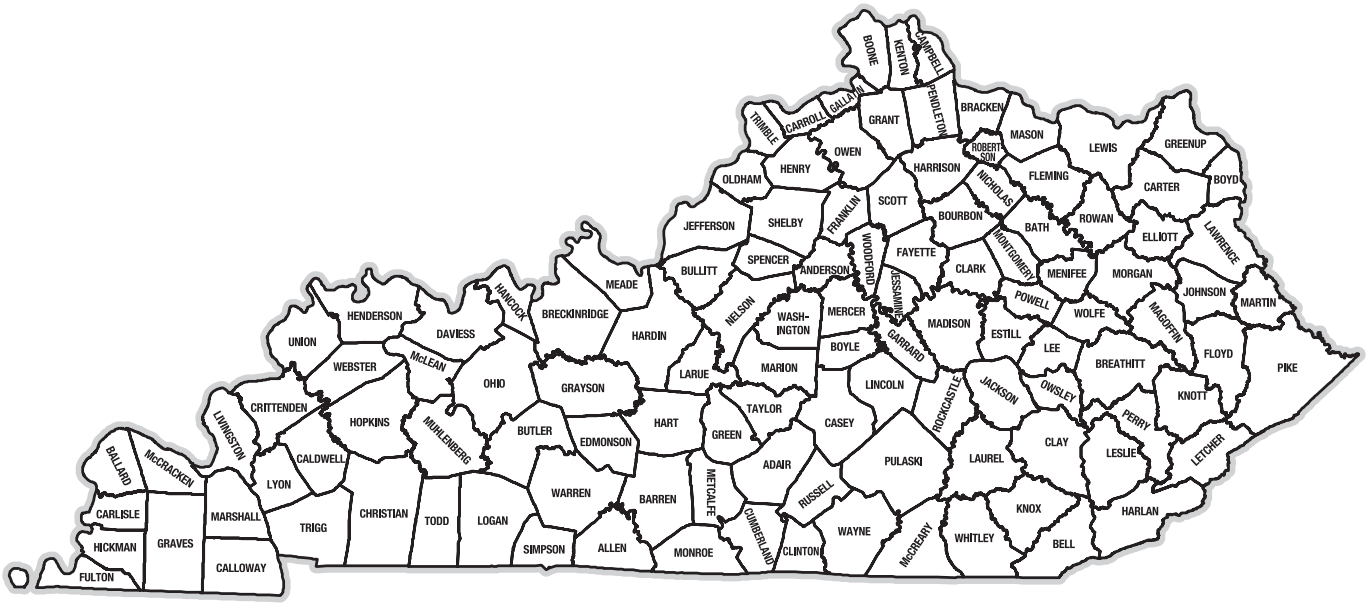
KENTUCKY FARM 2 SCHOOL

Fruit Nutrients and Producers

Fruit	Season	Nutrients	Producers	Location

KENTUCKY FARM 2 SCHOOL

Kentucky Counties



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LESSON 4 **ACTIVITY SHEET 4-3**

KENTUCKY FARM 2 SCHOOL

Fruit Variety Comparison

Fruit	Variety	Texture	Visual Difference	Flavor	Uses

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? _____

_____

KENTUCKY FARM 2 SCHOOL

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. The 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 pawpaw tree grows across most of 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:

Strang, J. (2011). *American persimmons.* Retrieved from **http://www.uky.edu/Ag/CDBREC/introsheets/persimmon.pdf**

Wilson, D. (n.d.) *How to use persimmons.* Retrieved from **http://www.davewilson.com/homegrown/promotion/persimmons.pdf**

Jones, S.C. & Layne, D.R. (1977). *Cooking with pawpaw.* Retrieved from **http://www.hort.purdue.edu/newcrop/ksu-pawpaw/cooking.html**

Kentucky State University (2003). *KSU pawpaw project.* **Retrieved from http://www.pawpaw.kysu.edu**

Pomper, K.W. et al (2008). *The Kentucky pawpaw regional variety trial.* Retrieved from **http://www.clemson.edu/hort/peach/pdfs/JAPS6225869.pdf**

Nesom, G. (n.d.). *Common persimmons.* Retrieved from **http://plants.usda.gov/plantguide/pdf/pg_divi5.pdf**

The American Pomological Society (n.d). *Workshop 13: native fruits of the Midwest.* Retrieved from **http://www.pawpaw.kysu.edu/PDF/PomperAPSfin2.pdf**

ODonnel, K. (2008). *The pleasures of persimmons.* Retrieved from **http://voices.washingtonpost.com/mighty-appetite/2008/11/the_pleasures_of_persimmons.html**

Kentucky State University Cooperative Extension Program

Forest Production of Pawpaw

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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.

Pawpaw fruit

Native pawpaw patch near stream

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.

Created October/ 2009

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.

Pawpaw fruit cluster

Pawpaw flower

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.
The Kentucky Division of Forestry pawpaw seedling order form: www.forestry.ky.gov/seedling.
The KSU Pawpaw Nurseries List: http://www.pawpaw.kysu.edu/pawpaw/nurslst.htm.

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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.

Crop Diversification & Biofuel Research & Education Center

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 droughty. 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) http://www.na.fs.fed.us/pubs/silvics_manual/volume_2/diospyros/virginiana.htm
- Common Persimmon Plant Guide (PLANTS Database, USDA NRCS, 2006) http://plants.usda.gov/plantguide/pdf/pg_divi5.pdf
- Horticultural Improvement of the American Persimmon (The Persimmon Patch, 2007) http://www.simmonfruit.net/persimmon_improvement.html
- Persimmon (Virginia Tech, 2001) http://www.sfp.forprod.vt.edu/factsheets/persimmon.pdf
- Persimmons: An Over-View of Cultivars, Production, Harvesting, and Marketing (Washington State University) *10.68 MB file* http://ucce.ucdavis.edu/files/datastore/391-472.pdf
- Persimmons, Asian and American (ATTRA, 2010) https://attra.ncat.org/attra-pub/summaries/summary.php?pub=10

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

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LESSON 4 **HANDOUT 4-6**

KENTUCKY FARM 2 SCHOOL

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 to12 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

Nutrition Facts

Serving Size (133g)
Servings Per Container

Amount Per Serving	
Calories 120	Calories from Fat 5
	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrate 30g	**10%**
Dietary Fiber 2g	**8%**
Sugars 27g	
Protein 0g	

Vitamin A 0%	• Vitamin C 2%
Calcium 0%	• Iron 2%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

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

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

Homemade Fruit Rollups with Sugar Substitute

Nutrition Facts

Serving Size (120g)
Servings Per Container

Amount Per Serving	
Calories 50	Calories from Fat 5
	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrate 14g	**5%**
Dietary Fiber 2g	**8%**
Sugars 11g	
Protein 0g	

Vitamin A 0%	• Vitamin C 2%
Calcium 0%	• Iron 2%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

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

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>.

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LESSON 4 | HANDOUT 4-7

KENTUCKY FARM 2 SCHOOL

World Map

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KENTUCKY FARM 2 SCHOOL

LESSON 5

OILS

Sydney Hughes, 6th grade, Rockcastle County Middle School

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 5 FACILITATOR GUIDE

KENTUCKY FARM 2 SCHOOL

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
   - Handout 5-1
   - NEP-207A
   - NEP-207B

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

- Activity sheet 5-2, Kentucky Oils & Fats; Where To Find Them!
- NEP-207A_Oils
- NEP-207B_Solid Fats and Added Sugars (SoFAS) Know the Limits

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

(Script) *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'.

(Script)

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/**

Mapping the Food Environment **http://blogs.usda.gov/2011/01/19/mapping-the-food-environment/**

Vegetables:

Vegetable Production Guide for Commercial Growers 2012-13 **http://www.ca.uky.edu/agc/pubs/id/id36/id36.pdf**

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

State Soy Crop Statistics **http://soystats.com/2010/page_14.htm**

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:

2009 Sample Cost to Produce Grain Sorghum **http://www.coststudies.ucdavis.edu/files/SorghumGrainVS2009.pdf**

Livestock:

USDA Agricultural Marketing Service **http://www.ams.usda.gov/AMSv1.0/**

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

- Golden Foods – **http://www.kyagr.com/kdapage.aspx?id=156** 2520 S. Seventh Street Rd., Louisville, KY 40208, 502-636-3712
- Owensboro Grain Edible Oils – 719 E. 2nd Street., Owensboro, KY 42303, 270-926-2032

Reference:

The Nemours Foundation. (2011). *Figuring out fat and calories.* Retrieved from **http://kidshealth.org/teen/food_fitness/nutrition/fat_calories.html#**

KENTUCKY FARM 2 SCHOOL

Kentucky Farm 2 School Grades 9-10: Lesson 5 Only A Little Oil Will Do!	
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.9-10.7. 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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 11-12: Lesson 5 Only A Little Oil Will Do!	
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

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 5 **HANDOUT 5-1**

KENTUCKY FARM 2 SCHOOL

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) Know the Limits
- 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, doughnuts, cookies
  - Deep-fried food and snacks

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LESSON 5 **ACTIVITY SHEET 5-1**

KENTUCKY FARM 2 SCHOOL

How Much Fat is in It?

Food	Amount	Fat Grams	Calories
Margarine	1 teaspoon		
Oil	1 teaspoon		
Sour cream	2 tablespoons (6 teaspoons)		
Salad dressing	1 tablespoon (3 teaspoons)		
Cream cheese	1 ounce		
Mayonnaise	1 tablespoon (3 teaspoons)		

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LESSON 5 | ACTIVITY SHEET 5-2

KENTUCKY FARM 2 SCHOOL

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/**

Fresh Food Central **http://www.freshfoodcentral.com/**

Mapping the Food Environment **http://blogs.usda.gov/2011/01/19/mapping-the-food-environment/**

Vegetables:

Vegetable Production Guide for Commercial Growers 2012-13 **http://www.ca.uky.edu/agc/pubs/id/id36/id36.pdf**

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

State Soy Crop Statistics **http://soystats.com/2010/page_14.htm**

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**

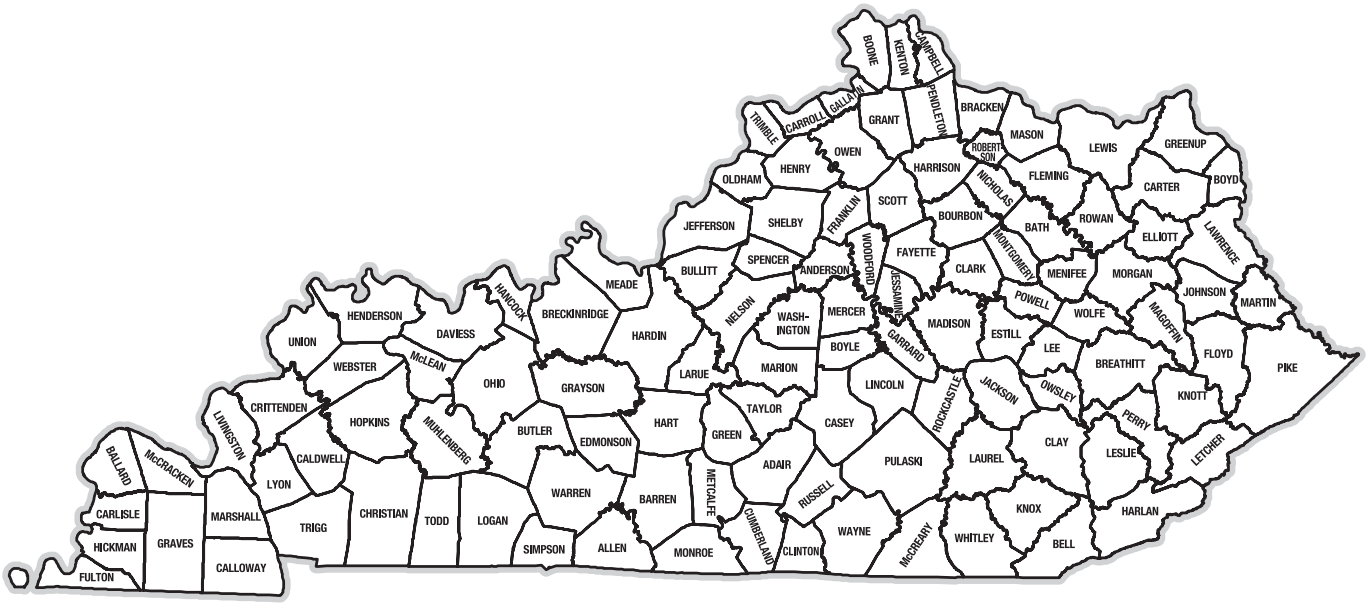
Livestock:

USDA Agricultural Marketing Service **http://www.ams.usda.gov/AMSv1.0/**

E-extension Hogs, Pigs and Pork **www.extension.org/swine**

KENTUCKY FARM 2 SCHOOL

Kentucky Counties



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LESSON 5 **HANDOUT 5-2**

KENTUCKY FARM 2 SCHOOL

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

Nutrition Facts

Serving Size (80g)
Servings Per Container

Amount Per Serving

Calories 280	Calories from Fat 270
	% Daily Value*
Total Fat 30g	**46%**
Saturated Fat 18g	**90%**
Trans Fat 1g	
Cholesterol 110mg	**37%**
Sodium 30mg	**1%**
Total Carbohydrate 2g	**1%**
Dietary Fiber 0g	**0%**
Sugars 0g	
Protein 2g	

Vitamin A 25% • Vitamin C 0%
Calcium 6% • Iron 0%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

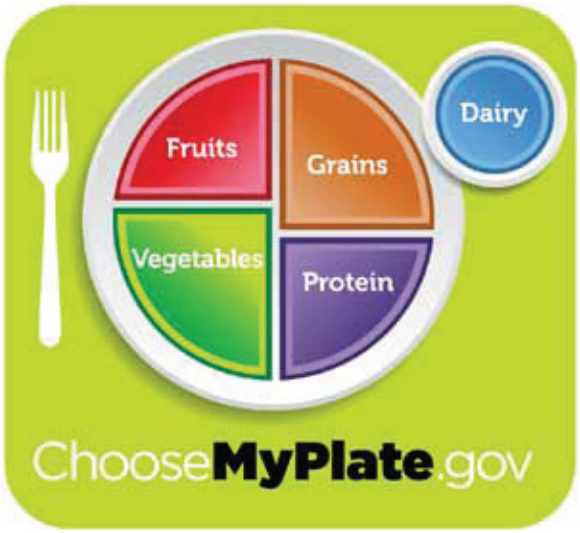
Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

NEP-207A

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.

Recommended Daily Calories	Recommended Amount of Oil Per Day
1,000	3 teaspoons
1,200-1,400	4 teaspoons
1,600-1,800	5 teaspoons
2,000-2,200	6 teaspoons
2,400	7 teaspoons
2,600-2,800	8 teaspoons
3,000	10 teaspoons
3,200	11 teaspoons



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 polyunsaturated 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."

Written by Kathy Daly-Koziel, former EFNEP Coordinator

Revised by Jackie Walters, MBA, RD, Extension Specialist for Nutrition Education Programs

Reference: The American Heart Association, http://www.heart.org/HEARTORG/GettingHealthy/FatsAndOils/Fats101/ downloaded 1/11/12

Revised 4-2012

NEP-207B

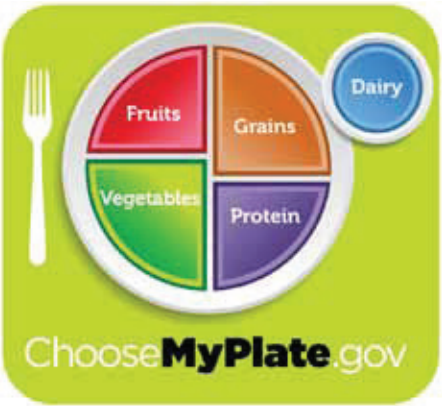
SOLID FATS AND ADDED SUGARS (SoFAS)
Know the Limits

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)

Recommended Daily Calories	Limit for Calories from SoFAS
1,000	140
1,200-1,600	120
1,800	160
2,000	260
2,200	270
2,400	330
2,600	360
2,800	400
3,000	460
3,200	600

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.

How Much Fat Is in It?

Food	Amount	Fat Grams	Calories
Margarine	1 teaspoon	4	36
Butter	1 teaspoon	4	36
Shortening	1 teaspoon	4	36
Sour cream	2 tablespoons (6 teaspoons)	6	54
Salad dressing	1 tablespoon (3 teaspoons)	7	63
Cream cheese	1 ounce	10	90
Mayonnaise	1 tablespoon (3 teaspoons)	11	99

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

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	
Serving Size (21g)	Servings Per Container
Amount Per Serving	
Calories 90	Calories from Fat 25
	% **Daily Value***
Total Fat 3g	5%
Saturated Fat 0g	0%
Trans Fat 0g	0%
Cholesterol 0mg	0%
Sodium 80mg	4%
Total Carbohydrates 15g	5%
Dietary Fiber 1g	4%
Sugars 6g	
Protein 2g	

Vitamin A 0%	**Calcium** 0%
Vitamin C 0%	**Iron** 4%

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

	Calories:	**2,000**	**2,500**
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate	300g	375g	
Dietary Fiber	25g	30g	

Calories per gram:

Fat 9 • Carbohydrate 4 • Protein 4

INGREDIENTS: 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 EMULSIFIER), 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?

Food Groups	Added Sugars (teaspoons)
Grains	
Bread, 1 slice	0
Muffin, 1 medium	1
Cookies, 2 medium	1
Danish Pastry, 1 medium	1
Donut, 1 medium	2
Dry cereal, sweetened, 1 oz.	amount differs (check product label)
Pound cake, nonfat, 1oz.	2
Angel food cake, 1/12 tube cake	5
Cake, frosted, 1/16 average cake	6
Pie, fruit, 2 crust, 1/6 8" pie	6
Fruit	
Fruit, canned in juice, ½ cup	0
Fruit, canned in light syrup, ½ cup	2
Fruit, canned in heavy syrup, ½ cup	4

Food Groups	Added Sugars (teaspoons)
Dairy	
Milk, plain, 1 cup	0
Chocolate milk, 2%, 1 cup	3
Low-fat yogurt, plain, 8 ounces	0
Low-fat yogurt, flavored, 8 ounces	5
Low-fat yogurt, fruit, 8 ounces	7
Ice cream or frozen yogurt, ½ cup	3
Chocolate shake, 10 fluid ounces	9
Other	
Sugar, jam or jelly, 1 teaspoon	1
Syrup or honey, 1 tablespoon	3
Chocolate bar, 1 ounce	3
Fruit sorbet, ½ cup	3
Gelatin dessert, ½ cup	4
Sherbet, ½ cup	5
Soft drink, 12 fluid ounces	9
Fruit drink ade, 12 fluid ounces	12

Note: 4 grams of sugar = 1 teaspoon

Written by Kathy Daly-Koziel, former EFNEP Coordinator

Revised by Jackie Walters, MBA, RD, LD, Extension Specialist for Nutrition Education Programs

Revised 4-2012

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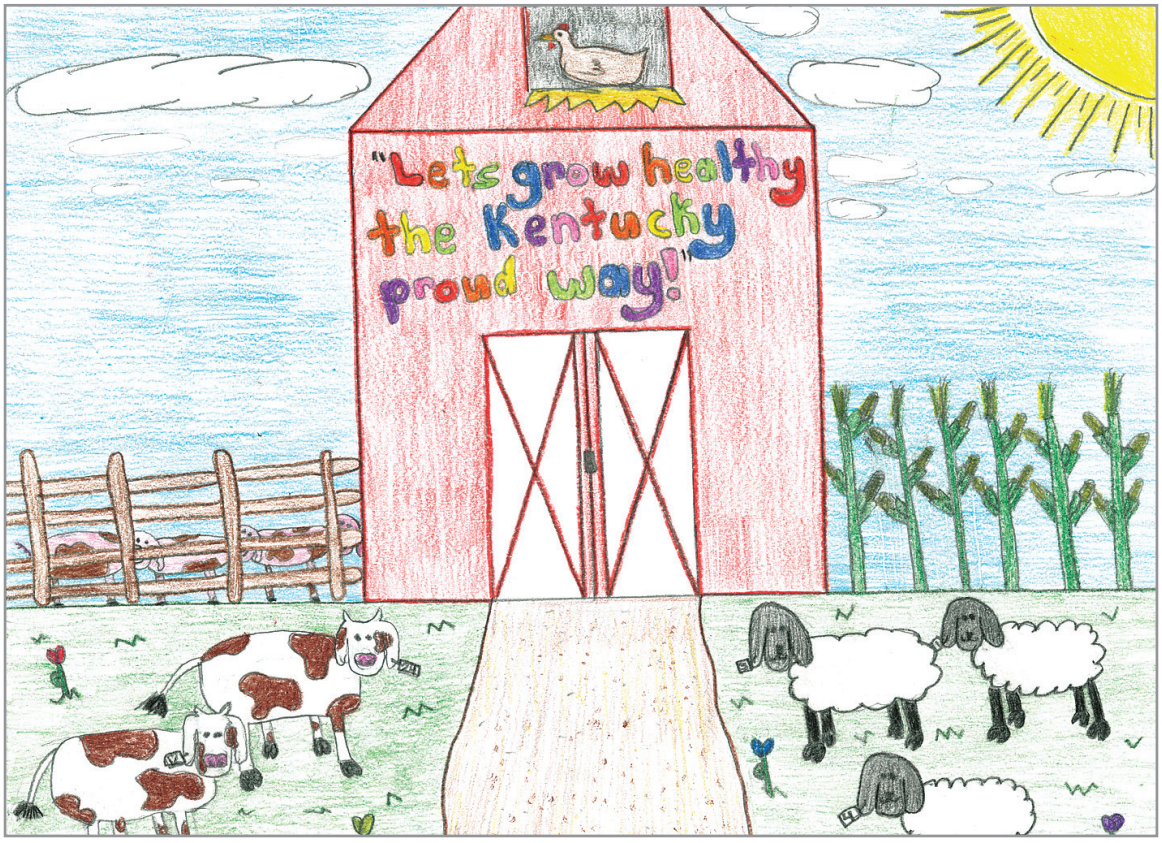
UNIVERSITY OF KENTUCKY College of Agriculture

KENTUCKY FARM 2 SCHOOL

LESSON 6

DAIRY



Miranda Brown, 6th grade, Rockcastle County Middle School

KENTUCKY FARM 2 SCHOOL

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

- Handout 6-1 Types of Milk
- FN-AP.004, Many Milks
- Activity sheet 6-2 Dairy: Nutritional Content
- Handout can also be used for overhead notes 6-2 It's All about the Cheese
- Activity sheet 6-3 Cheesy Terms
- Activity sheet 6-4 Different Categories of Cheese
- Handout 6-3 Ice Cream in a Bag
- Activity sheet 6-5 Dairy Field Trip Review Guide

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

(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.

Review with students NEP-206 "Get Your Calcium-Rich Foods" and NEP 206B "Bone Up on Calcium."

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)

- Milk
- Cheese
- Yogurt
- Pudding
- Ice milk
- Frozen yogurt
- Ice cream
- Fruit smoothies/milk shakes

Using the list of foods students developed, have them 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**

Breeds of Livestock **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**

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://milkfacts.info/Nutrition%20Facts/Nutrient%20Content.htm**

Nutrition Facts **http://nutritiondata.self.com/facts/dairy-and-egg-products/74/2**

Nutritional Information **http://www.usdec.org/Products/content.cfm?ItemNumber=82658**

Milk, 1% Low-Fat, Ultra High Temperature (UHT) **http://www.fns.usda.gov/fdd/facts/hhpfacts/New_HHPFacts/Dairy/HHFS_MILK_UHT_LOW-FAT_B385_Final.pdf**

USDA Commodity Food Fact Sheet for Schools & Child Nutrition Institutions **http://www.fns.usda.gov/fdd/schfacts/Others/B090_MilkInstantNonfatDry_4lb.pdf**

USDA Nutritive Value of Foods **http://www.nal.usda.gov/fnic/foodcomp/Data/HG72/hg72_2002.pdf**

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

(Script)

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

(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=CI65yYuRrKsCFcFM2godfGUh6g**

Kentucky Kate **http://www.kyagr.com/marketing/animalmktg/KYKate.htm**

KENTUCKY FARM 2 SCHOOL

Kentucky Farm 2 School Grades 9-10: Lesson 6 Not Just Milk Alone!	
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

Kentucky Farm 2 School Grades 11-12: Lesson 6 Not Just Milk Alone!	
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.11-12.5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. 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. 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.11-12.1. 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.

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NEP-206

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:

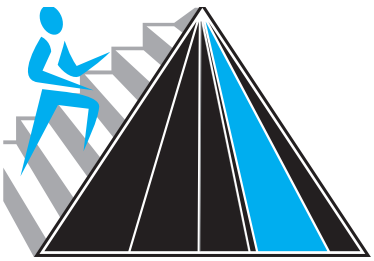
- 1 cup of milk
- 1 cup of yogurt
- 1½ ounces of natural cheese
- 2 ounces of process cheese
- 4 tablespoons of Parmesan cheese

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



Milk Group
Get your calcium-rich foods
MyPyramid.gov

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?

Food	Calcium Content (milligrams)
1 cup milk	290
1 cup yogurt	300
1 ounce cheese	200
1 ounce process cheese food	160
1 ounce process American cheese	125
½ cup cottage cheese	125
½ cup custard	250
½ cup pudding (made with milk)	150
½ cup ice cream	90
1 tablespoon Parmesan cheese	70

How much of each of the above foods would provide about the same amount of calcium as 1 cup of milk?

_____

Written by Kathy Daly-Koziel, former EFNEP Coordinator

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

Revised 11-2006

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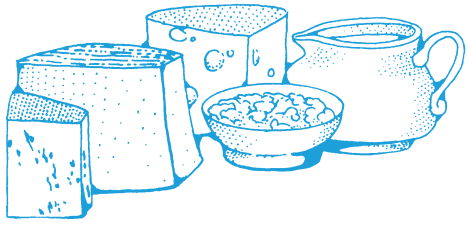
NEP-206B

MILK GROUP
Boning Up on Calcium

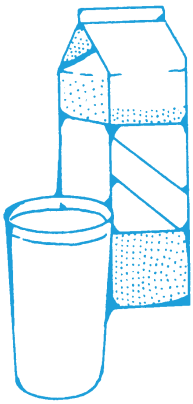


You can increase your calcium intake in many ways:

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 ⅓ 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.
   - **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 ⅓ 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.

2. Include milk as a beverage in family meals.
   - To improve the taste of milk made from nonfat dry milk, mix it with an equal amount of fluid milk or add a drop or two of vanilla. Chill before serving.



- 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.

4. Choose calcium-rich snacks and desserts.
   - 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 ⅓ 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
⅓ 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

Revised 11-2006

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 6 **ACTIVITY SHEET 6-1**

KENTUCKY FARM 2 SCHOOL

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

Breeds of Livestock
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.

Alternative activity - Find and map Kentucky dairy farms and processors. Processors and manufacturing plants can be found at the Kentucky Department of Agriculture website **http://www.kyagr.com/marketing/animalmktg/DairyResources.htm**

KENTUCKY FARM 2 SCHOOL

Types of Milk

Pasteurized milk	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.
Homogenized milk	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.
Whole milk	Contains 3.3% milk fat.
2% milk	98% of the milk fat is removed.
1% milk	99% of the milk fat is removed.
Skim milk	Contain less than ½ % milk fat.
Nonfat dry milk	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.
Evaporated milk	Fresh whole milk concentrated by removing about 50% of the water.

KENTUCKY FARM 2 SCHOOL

Buttermilk	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.
Sweetened condensed milk	Fresh whole milk that has had approximately 50% of the water removed and sugar added.
Goats milk	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.
UHT (ultra high temperature) milk	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.
Cream	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.
Half and half	Equal parts of whole milk and cream. Half is cream and half is milk.

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LESSON 6 **ACTIVITY SHEET 6-2**

KENTUCKY FARM 2 SCHOOL

Dairy: Nutritional Content Worksheet — Activity sheet 6-2

Types of Milk Products	Calories per 1 Cup	Calories from fat	Total fat (g)	Saturated fat (g)	Cholesterol (mg)	Sodium (mg)	Carbohydrate (g)	Sugars (g)	Protien (g)	Vitamin A (%)	Vitamin D (%)	Calcium (%)
Whole homogenized milk												
1% milk												
2% milk												
Chocolate fat-free milk												
Fat-free skim milk												
nonfat dry milk (NFDM)												
Reconstituted evaporated milk												
Fat-free Buttermilk												
Sweetened condensed milk												
Goats milk												
Ultra high temperature milk												
Half and half												
Light cream												
Heavy cream												

KENTUCKY FARM 2 SCHOOL

Dairy: Nutritional Content Worksheet Key Activity sheet 6-2 key

Types of Milk Products	Calories per 1 Cup	Calories from fat	Total fat (g)	Saturated fat (g)	Cholesterol (mg)	Sodium (mg)	Carbohydrate (g)	Sugars (g)	Protien (g)	Vitamin A (%)	Vitamin D (%)	Calcium (%)
Whole homogenized milk	150	72	8	5	35	130	13	13	8			
1% milk	110	20	2.5	1.5	10	125	13	12	9	10	25	30
2% milk	130	45	5	3	20	125	13	12	8	10	25	30
Chocolate fat-free milk	140				5	180	27	26	8	10	25	30
Fat-free skim milk	90				5	125	13	12	8	10	25	30
nonfat dry milk (NFDM)	434	8	0.92	0.599	24	642	62.38	62.38	43.39	1		151
Reconstituted evaportated milk	200	5	0.51	0.31	10	294	29.06	29.06	19.33	20		74
Fat-free Buttermilk	90				5	260	13	12	8	10	25	30
Sweetened condensed milk	982	234	27	17	104	389	166	166	24	16		87
Goats milk	244	168	89	7	27	122	11	11	9	10		33
Ultra high temperature milk	100	20	2.5	1.5	12	110	12	12	8	10		30
Half and half	315	250	27.83	17.32	90	99	10.41	0.39	7.16	17		25
Light cream	468	407	46	29	158	96	9		6	31		23
Heavy cream	414	390	44	28	164	46	3		2	35		8

KENTUCKY FARM 2 SCHOOL

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

KENTUCKY FARM 2 SCHOOL

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

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LESSON 6 **ACTIVITY SHEET 6-3**

KENTUCKY FARM 2 SCHOOL

Cheesy Terms

• **Whey** - _____

_____

• **Rennin** - _____

_____

• **Curds** – _____

_____

• **Ripened cheese** – _____

_____

• **Unripened cheese** – _____

_____

• **Coagulate** - _____

_____

• **Vat** - _____

_____

• **Emulsify** – _____

_____

U.S. Dairy Export Council, (2011). Products. Retrieved from http://www.usdec.org/Products/content.cfm?ItemNumber=82327&navItemNumber=82243

KENTUCKY FARM 2 SCHOOL

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

U.S. Dairy Export Council, (2011). Products. Retrieved from http://www.usdec.org/Products/content.cfm?ItemNumber=82327&navItemNumber=82243

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LESSON 6 **ACTIVITY SHEET 6-4**

KENTUCKY FARM 2 SCHOOL

Categories of Cheese

Category	Description	Variety of Cheese
Soft-Fresh Cheese		
Soft-Ripened Cheese		
Semi-Soft Cheese		

KENTUCKY FARM 2 SCHOOL

Semi-Hard Cheese		
Hard Cheese		
Processed Cheese		

U.S. Dairy Export Council, (2011). Products. Retrieved from http://www.usdec.org/Products/content.cfm?ItemNumber=82327&navItemNumber=82243

KENTUCKY FARM 2 SCHOOL

Categories of Cheese Key

Category	Description	Variety of Cheese
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

Hard Cheese	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
Processed Cheese	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

U.S. Dairy Export Council, (2011). Products. Retrieved from http://www.usdec.org/Products/content.cfm?ItemNumber=82327&navItemNumber=82243

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LESSON 6 **HANDOUT 6-3**

KENTUCKY FARM 2 SCHOOL

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**.

Whole milk

Nutrition Facts

Serving Size (256g)
Servings Per Container

Amount Per Serving

Calories 250	Calories from Fat 70
	% Daily Value*
Total Fat 7g	**11%**
Saturated Fat 4g	**20%**
Trans Fat 0g	
Cholesterol 25mg	**8%**
Sodium 100mg	**4%**
Total Carbohydrate 37g	**12%**
Dietary Fiber 0g	**0%**
Sugars 37g	
Protein 7g	

Vitamin A 8%	• Vitamin C 0%
Calcium 25%	• Iron 0%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

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

KENTUCKY FARM 2 SCHOOL

2 % Milk

Nutrition Facts

Serving Size (256g)
Servings Per Container

Amount Per Serving

Calories 240	Calories from Fat 40
	% Daily Value*
Total Fat 4.5g	**7%**
Saturated Fat 3g	**15%**
Trans Fat 0g	
Cholesterol 20mg	**7%**
Sodium 135mg	**6%**
Total Carbohydrate 38g	**13%**
Dietary Fiber 0g	**0%**
Sugars 38g	
Protein 9g	

Vitamin A 8% • Vitamin C 4%

Calcium 35% • Iron 0%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

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

Non-fat Milk

Nutrition Facts

Serving Size (256g)
Servings Per Container

Amount Per Serving

Calories 190	Calories from Fat 5
	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 5mg	**2%**
Sodium 120mg	**5%**
Total Carbohydrate 37g	**12%**
Dietary Fiber 0g	**0%**
Sugars 37g	
Protein 8g	

Vitamin A 20% • Vitamin C 4%

Calcium 45% • Iron 0%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

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

Low fat Buttermilk

Nutrition Facts

Serving Size (256g)
Servings Per Container

Amount Per Serving

Calories 200	Calories from Fat 20
	% Daily Value*
Total Fat 2g	**3%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Cholesterol 10mg	**3%**
Sodium 240mg	**10%**
Total Carbohydrate 37g	**12%**
Dietary Fiber 0g	**0%**
Sugars 37g	
Protein 8g	

Vitamin A 2% • Vitamin C 4%

Calcium 25% • Iron 0%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

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

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LESSON 6 | ACTIVITY SHEET 6-5

KENTUCKY FARM 2 SCHOOL

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? _____

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FN-AP.004

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.(2) 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.(2)

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.(2)

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.(2)

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.(2,3)

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.(2)

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.(4) 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.(5)

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.(6)

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.(7)

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.(8)

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^{o}F to 302^{o}F for at least 2 seconds, followed by rapid cooling to 40^{o}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)

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

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)

Age	Amount
1-3 years	700 mg
4-8 years	1,000 mg
9-18 years	1,300 mg
19-70 years	1,000 mg
71+ years	1,200 mg

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

MILK VARIETY 1 cup	AMOUNT (mg)
Whole (3.25% milk fat) (cow)	276
2% Milk (cow)	293
1% Milk (cow)	305
Skim Milk (cow)	299
Whole (goat)	327
Soy (regular)	301
Soy (light)	199
Coconut	41
Almond	200
Rice	293
Hemp	428

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)

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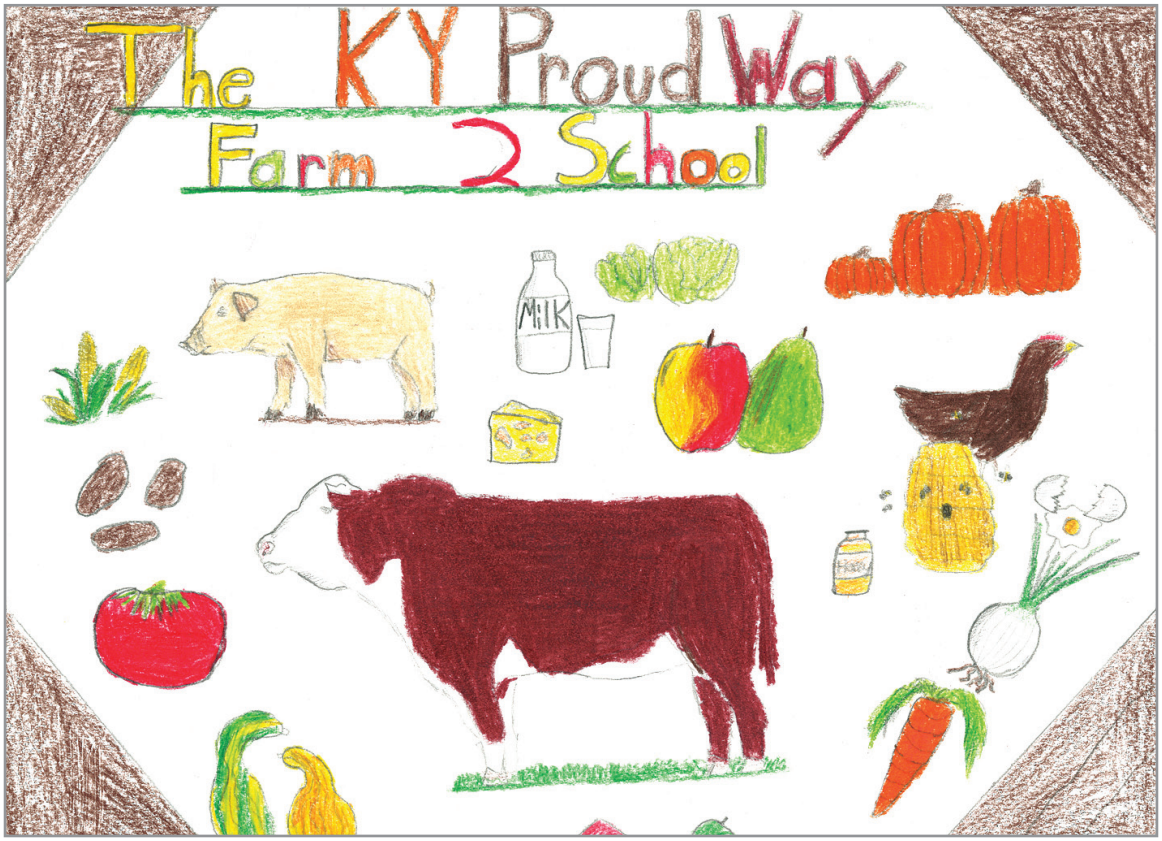
COOPERATIVE EXTENSION SERVICE • UNIVERSITY OF KENTUCKY • COLLEGE OF AGRICULTURE • LEXINGTON, KY, 40546

UNIVERSITY OF KENTUCKY
College of Agriculture

KENTUCKY FARM 2 SCHOOL

LESSON 7

PROTEIN



Dagan Montgomery, 8th grade, Woodford County Middle School

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 7 FACILITATOR GUIDE

KENTUCKY FARM 2 SCHOOL

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
   - Activity 4

4. Identify Kentucky-grown and/or produced protein products.
   Contributing activities
   - Activity 2
   - Activity sheet 7-2
   - NEP 205
   - NEP 205a
   - FN-SSB.044
   - Handout 7-2
   - Handout 7-3

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 Equipement

- 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

- NEP 205A – How Much is Enough?
- FN-SSB.044 Wild Game: From Field to Table
- Handout 7-2 Kentucky USDA Processing Plants Who Slaughter
- Handout 7-3 USDA-Inspected Plants in Kentucky

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:

- *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, 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.

(Script)

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/**

Meat Preparation **http://www.fsis.usda.gov/factsheets/beef_from_farm_to_table/index.asp**

Poultry Preparation **http://www.fsis.usda.gov/factsheets/Poultry_Preparation_Fact_Sheets/index.asp**

Egg Products Preparation **http://www.fsis.usda.gov/factsheets/Egg_Products_Preparation_Fact_Sheets/index.asp**

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**

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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 9-10: Lesson 7 Powerful Proteins	
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	
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.11-12.5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. 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. 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.11-12.1. 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.

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 7 **HANDOUT 7-1**

KENTUCKY FARM 2 SCHOOL

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 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.

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 7 **ACTIVITY SHEET 7-1**

KENTUCKY FARM 2 SCHOOL

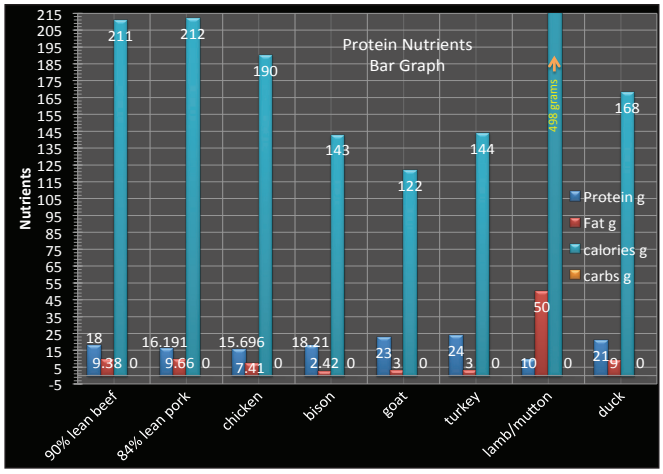
Cost/Serving and Nutritional value of Kentucky Proteins (Activity sheet 7-1)

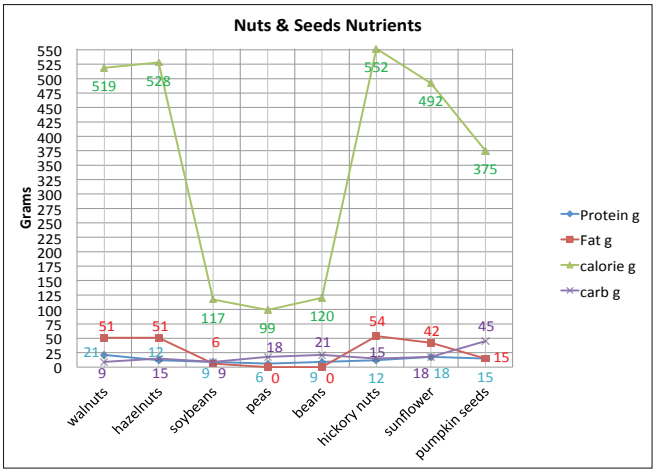
Cooked Meat 3oz (90 g)	Cost per lb	Servings per lb	Cost per serving	Nurtitional Value					
				Protein g	Fats g	Cholesteral mg	Iron mg	Calories g	Carbs g
90% Lean Beef									
84% Lean Pork									
Chicken									
Bison									
Prawn/freshwater shrimp									
Trout									
Catfish									
Paddlefish caviar									
Goat									
Turkey									
Lamb/mutton									
Duck									
Squirrel	Not Sold To Consumers								
Rabbit									
Venison									
Walnuts									
Hazelnuts									
Soybeans									
Peas									
Beans									
Hickory nuts									
Sunflower seed									
Pumpkin seed									

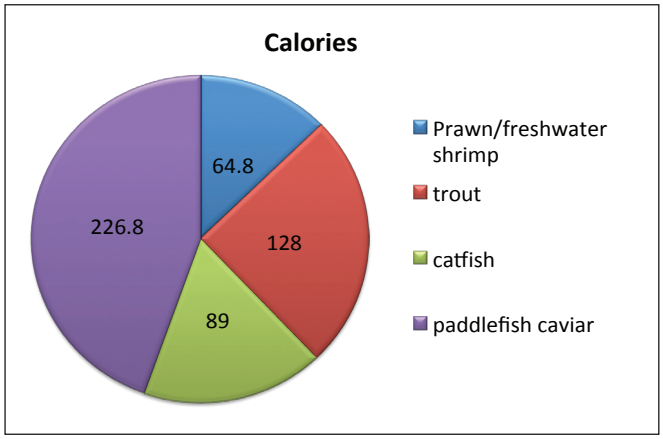
Cost/Serving and Nutritional value of Kentucky Proteins (Answer Key activity sheet 7-1)									
Cooked Meat 3oz (90 g)	Cost per lb	Servings per lb	Cost per serving	Nurtitional Value					
				Protein g	Fats g	Cholesterol mg	Iron mg	Calories g	Carbs g
90% Lean Beef				18	9.38	86	2.448	211	0
84% Lean Pork				16.191	9.66	86	0.99	212	0
Chicken				15.696	7.41	89	1.089	190	0
Bison				18.21	2.42	82	3.078	143	0
Prawn/freshwater shrimp				14.04	5.4	135	2.6	64.8	0
Trout				19	5	59	1.6	128	0
Catfish				16	2	61	0.3	89	0
Paddlefish caviar				22.14	16.11	529.2	10.6	226.8	0
Goat				23	3	64	3.2	122	0
Turkey				24	3	63	1.5	144	0
Lamb/mutton				10	50	97	1.1	498	0
Duck				21	9	75	2.7	168	0
Squirrel	Not Sold To Consumers			26	4	103	5.8	147	0
Rabbit				28	3	105	4.1	147	0
Venison				26	2	67	3.5	128	0
Walnuts				21	51	0	2.7	519	9
Hazelnuts				12	51	0	3.9	528	15
Soybeans				9	6	0	2.1	117	9
Peas				6	0	0	1.2	99	18
Beans				9	0	0	1.8	120	21
Hickory nuts				12	54	0	1.8	552	15
Sunflower seed				18	42	0	4.5	492	18
Pumpkin seed				15	15	0	2.7	375	45
most nutrition information found http://nutritiondata.self.com/ (NutritionData.com, 2011)									

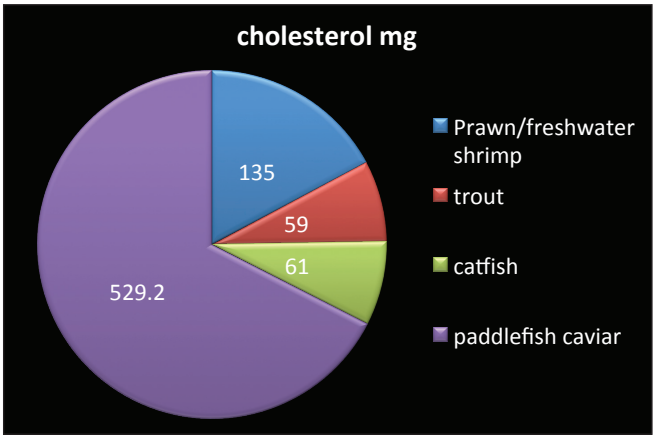
KENTUCKY FARM 2 SCHOOL

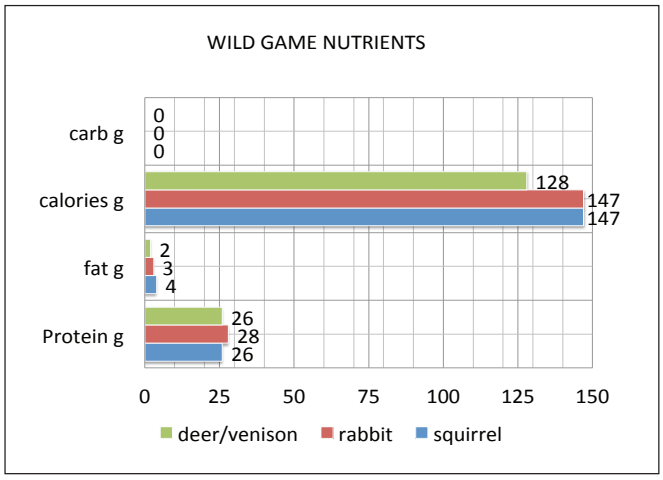
Graph Examples











UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 7 | ACTIVITY SHEET 7-2

KENTUCKY FARM 2 SCHOOL

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/**

Meat Preparation **http://www.fsis.usda.gov/factsheets/beef_from_farm_to_table/index.asp**

Poultry Preparation **http://www.fsis.usda.gov/factsheets/Poultry_Preparation_Fact_Sheets/index.asp**

Egg Products Preparation **http://www.fsis.usda.gov/factsheets/Egg_Products_Preparation_Fact_Sheets/index.asp**

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**

NEP-205

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

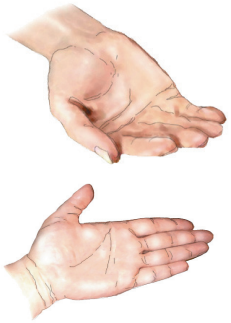
These foods belong in the Meat and Bean Group, as well.

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.

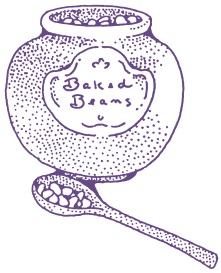
Did You Know?

- 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.

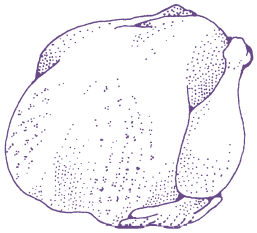
Stretching Your Dollar

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

Revised 11-2006

NEP-205A

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

Type of Meat	Market Unit	Servings per Unit
Boneless meats such as ground beef, stew meat, ready-to-serve ham, bologna, liver, round steak, flank steak	1 pound	4
Meat with some bone and fat such as beef chuck, pork shoulder, picnic ham, most roasts, pork chops, steaks	1 pound	3
Meat with much waste such as short ribs, spareribs, chicken wings, and backs	1 pound	1 or 2
Chicken, whole fryer	3 pounds	5 or 6
Fish, canned	15 to 16 ounces	4
Tuna	7 ounces	2

Note: One pound of dry beans makes 6 cups when cooked. A 1-pound can of cooked beans is 2 cups.

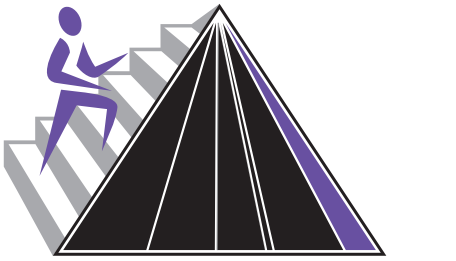
Reminder: Meat, fish, and poultry spoil easily. Buy only as much as you can use or store before they spoil.

Which is the best buy?

- ❑ 3-pound whole chicken for $4.49

  or

- ❑ Skinless, boneless chicken breasts for $3.99 per pound?



Meat & Bean Group

Go lean with protein

MyPyramid.gov

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.

Written by Kathy Daly-Koziel, former EFNEP Coordinator

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

Revised 11-2006

FN-SSB.044

UK COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY — COLLEGE OF AGRICULTURE

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.

Birds		**Mammals**		**Amphibians and Reptiles**
Dark	Light	Fatty	Lean	
Dove	Grouse	Opossum	Squirrel	Frog Legs
Duck	Quail	Raccoon	Beaver	Turtle
Goose	Turkey	Groundhog	Muskrat	Rattlesnake
Woodcock		Bear	Rabbit	
Wilson's Snipe		Hog	Deer	

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

Meat	Braise	Fry	Roast	BBQ	Broil	Smoke	Stew	Bake
Deer	✓	✓	✓	✓	✓	✓	✓	
Dove	👍	✓					✓	✓
Duck			👍	✓			✓	
Frog Legs		👍				✓		
Goose			👍				✓	
Groundhog	✓		✓	👍			✓	✓
Opossum			👍		✓	✓		
Quail	👍	✓	✓		✓			
Rabbit	✓	✓	✓	👍		✓	✓	✓
Raccoon		✓	✓	👍		✓	✓	✓
Rattlesnake	✓							
Squirrel	👍			✓	✓		✓	
Turkey			👍	✓		✓		
Turtle	✓						✓	
👍 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
½ cup part-skim mozzarella cheese, shredded
1 (6-ounce) can tomato paste
1 teaspoon oregano, dried
½ teaspoon basil, dried
½ cup cottage cheese, 1 %
⅔ cup biscuit mix
2 eggs
1 cup skim milk
½ teaspoon pepper
1 teaspoon salt

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 (¼ slice): 290 calories, 39g protein, 15g carbohydrate, 8g fat

Baked Barbecued Rabbit

2 ¾ pound rabbit, cooked, in pieces
Salt and pepper to taste
2 (8-ounce) cans tomato sauce
1 teaspoon Worcestershire sauce
1 teaspoon chili powder
½ teaspoon red pepper
2 tablespoons vinegar
1 teaspoon prepared mustard
1 teaspoon garlic powder
½ cup brown sugar
1 onion, small, finely-chopped

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
1 onion, large, chopped
½ green pepper, chopped
2 tablespoon vegetable oil
1 (1 pound) can tomatoes
2 large cans chili beans
1 (8 ounce) can tomato sauce
1 teaspoon salt
1 bay leaf
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
5 onions, medium, chopped finely
5 green peppers, chopped
2 cups chopped celery
1 cup brown sugar
10 tablespoons vinegar
10 tablespoons lemon juice
2 cans (8 ounce) tomato soup
5 tablespoons worcestershire sauce
1 cup water
5 teaspoons mustard

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
⅓ cup bread crumbs
¼ 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

Nutritional Information for 3 ounces of raw wild game				
Meat	**Calories**	**Total Fat**	**Saturated Fat**	**Protein**
Deer	103	2	1	20
Dove	123	2.0	-	20
Duck (breast w/o skin)	105	4.0	1	17
Frog Legs	62	.25	-	14
Goose (w/o skin)	137	6	2	19
Groundhog	188	9	1	26
Opossum	188	9	1	26
Quail (breast w/o skin)	104	3	1	19
Rabbit	97	2	1	19
Raccoon	180	10	3	21
Squirrel	102	3	-	18
Turkey (white meat)	135	6	2	18
Turtle	76	.5	-	17

References:

Conservation Officers Cooking T.I.P.'s (1993). Compiled by Conservation Officer Brenda Louthain.
Venison Recipe Collection (2003). Compiled by Becky Nash.

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

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 7 **HANDOUT 7-2**

KENTUCKY FARM 2 SCHOOL

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
custonmeats@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

Hampton's Meat Proc. Co., Inc.
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

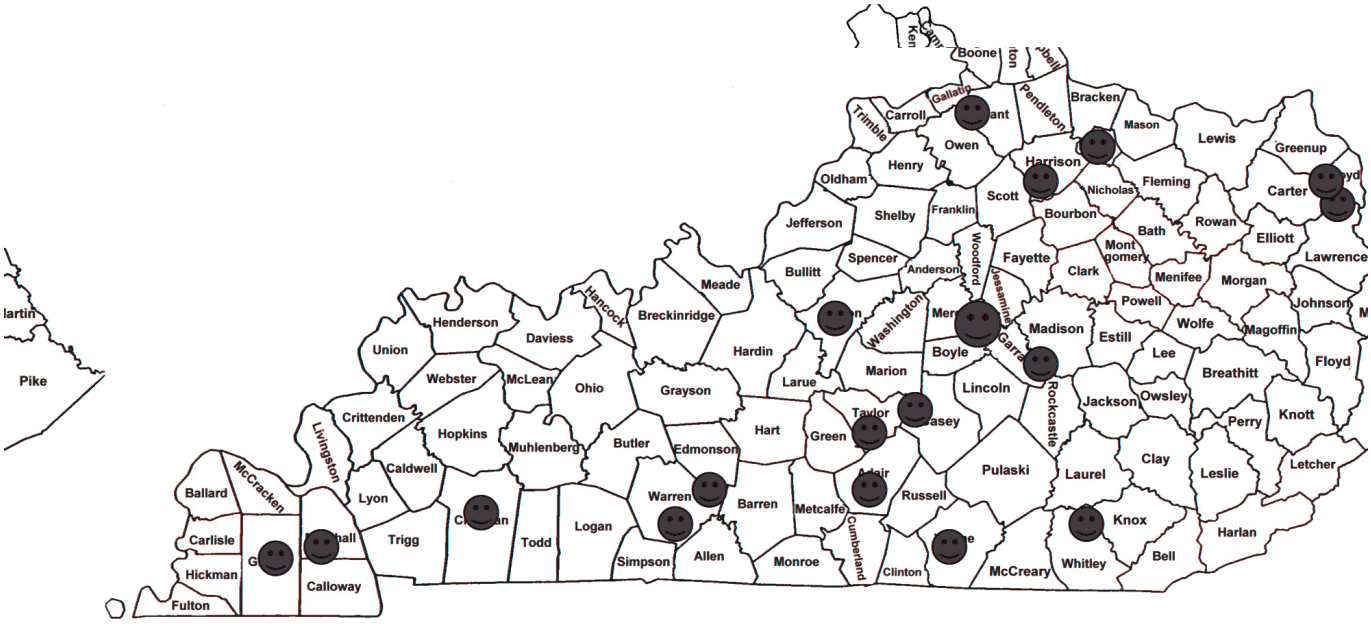
Wise Meat Packing Co.
2205 Longbranch Road.
Campbellsville, KY 42718
(270) 465-8464 (just hogs USDA)

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 7 **HANDOUT 7-3**

KENTUCKY FARM 2 SCHOOL

USDA-Inspected Plants



The yellow smiley faces indicate USDA-inspected plants. Figure out the names and specific locations of each.

KENTUCKY FARM 2 SCHOOL

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. Austrlorp

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

KENTUCKY FARM 2 SCHOOL

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UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 7 | ACTIVITY SHEET 7-4

KENTUCKY FARM 2 SCHOOL

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

KENTUCKY FARM 2 SCHOOL

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

KENTUCKY FARM 2 SCHOOL

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KENTUCKY FARM 2 SCHOOL

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    A. Nelson
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    C. Jefferson

KENTUCKY FARM 2 SCHOOL

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

KENTUCKY FARM 2 SCHOOL

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

KENTUCKY FARM 2 SCHOOL

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KENTUCKY FARM 2 SCHOOL

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UNIVERSITY OF KENTUCKY
College of Agriculture

KENTUCKY FARM 2 SCHOOL

LESSON 8

WRAPPING IT UP!

Joy Frith, 6th grade, Rockcastle County Middle School

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 8 FACILITATOR GUIDE

KENTUCKY FARM 2 SCHOOL

Facilitator Guide

Lesson 8: Wrapping It Up!

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 **http://www.kyagr.com/consumer/documents/FT%20POSTER8-11.pdf**

Your Food Environment Atlas **http://www.ers.usda.gov/foodatlas/**

Consumer Reports **www.consumerreports.org**

U.S. Bureau of Labor Statistics **http://www.bls.gov/K12/nature03.htm**

Fresh Food Central **http://www.freshfoodcentral.com/**

Mapping the Food Environment **http://blogs.usda.gov/2011/01/19/mapping-the-food-environment/**

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).

KENTUCKY FARM 2 SCHOOL

Kentucky Farm 2 School Grades 9-10: Lesson 8 Wrapping It Up!	
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.9-10.7. 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 FARM 2 SCHOOL

Kentucky Farm 2 School Grades 11-12: Lesson 8 Wrapping It Up!	
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

UNIVERSITY OF KENTUCKY College of Agriculture

LESSON 8 **ACTIVITY SHEET 8-1**

KENTUCKY FARM 2 SCHOOL

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.

KENTUCKY FARM 2 SCHOOL

FOOD EATEN & SERVING SIZE	IDENTIFY THE MYPLATE GROUP. *Grain, vegetable, fruit, dairy, protein*	DID YOU SOURCE THIS FOOD ITEM?	PRODUCED BY A KENTUCKY FARMER KENTUCKY PROUD YES/NO
BREAKFAST			
LUNCH			
DINNER			
SNACKS			
OILS			
SOLID FATS & ADDED SUGARS			
COMPLETE ACTIVITY SHEET TOTALS ON NEXT PAGE.			

KENTUCKY FARM 2 SCHOOL

	GRAINS	FRUITS	VEGETABLES	DAIRY	PROTEINS	OILS
TOTAL NUMBER OF SERVINGS						
TOTAL NUMBER OF KENTUCKY PROUD SERVINGS						
TOTAL NUMBER OF FOODS SOURCED						

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

KENTUCKY FARM 2 SCHOOL

Pre & Post Test Evaluation/Assesment

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

	GRAINS	FRUITS	VEGETABLES	DAIRY	PROTEINS	OILS
TOTAL NUMBER OF SERVINGS						
TOTAL NUMBER OF KENTUCKY PROUD SERVINGS						
TOTAL NUMBER OF FOODS SOURCED						

KENTUCKY FARM 2 SCHOOL

Post-curriculum evaluation results from Focus on Food & Farming, activity 8-1

	GRAINS	FRUITS	VEGETABLES	DAIRY	PROTEINS	OILS
TOTAL NUMBER OF SERVINGS						
TOTAL NUMBER OF KENTUCKY PROUD SERVINGS						
TOTAL NUMBER OF FOODS SOURCED						

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

Kentucky Proud.

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UNIVERSITY OF KENTUCKY
College of Agriculture

KENTUCKY FARM 2 SCHOOL

POST-LESSON

MATERIALS

Grant Isaacs, 6th grade, Rockcastle County Middle School

UNIVERSITY OF KENTUCKY College of Agriculture

POST-LESSON MATERIALS

KENTUCKY FARM 2 SCHOOL

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