**The relationship between agriculture and food, fiber, and energy**

**Connect values held by farmers to values held by learners**

 (9th – 12th Grade)

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| **Website**: <https://www.cias.wisc.edu/curriculum/modII/index.htm> <http://www.iowaagliteracy.org/resources/lesson-plans/lesson-plans.aspx> **Hands On**: Play My American Farm game (myamericanfarm.org) |

**Processed Food Breakdown**

# Purpose/Objective:

 Students will consider the nutritional value of various processed foods.

# Materials:

* 5 canned food items
* 5 frozen food items (or frozen food packaging) including frozen fruit or vegetables
* 5 boxed meals, including a cereal option
* 5 drinks
* 5 packaged baked goods/other packaged foods
* Any other processed food items deemed necessary
* Food Breakdown Worksheets

# Vocabulary (with definitions)

* **Processed Food:** any food product that is changed from its original raw state. For example, wheat seeds are ground to produce whole wheat flour. There are low-processed foods, like the whole wheat flour and a cream filled cake. Convenience food is commercially prepared food designed for ease of consumption and is most likely a highly processed food.
* **Calorie:** energy needed to raise the temperature of 1 gram of water 1 degree C; used to measure the energy value of foods.

# Background – Agricultural Connections

# (What would a teacher need to know before teaching this lesson):

 The food choices we make every day are an important factor in our overall health. Unfortunately, reading nutrition labels can sometimes be confusing. When looking at a nutrition label, important information includes: the serving size and calories, calories from fat, and percent daily value of ingredients like sodium and vitamins. Assessing the nutritional quality of processed foods requires the food label to paint a whole picture of what the food is providing.

 Some processing does not alter or even improves the nutritional quality of food. Studies have shown that frozen fruits and vegetables are just as healthy as their fresh counterparts, and in some cases, have more of key nutrients like beta-carotene. Some foods are processed to have additional nutrients. For example, cereals are often fortified with vitamins and minerals like iron, riboflavin, thiamin and folic acid.

 Students may need reminding that for men, the average daily consumption of calories should be 2500 calories. For women, it should be 2000 calories. A balanced meal should include a variety of proteins, vegetables, fruits, grains and dairy. Having too much of an ingredient like sugar or sodium can be detrimental to our health. Having too little of nutrients like Vitamin C can also be detrimental to our health.

 Food packaging may also include information aside from the nutritional label that can add difficulty to making appropriate food decisions. For many, labels like USDA organic, all natural, grass-fed, cage-free, hormone- and antibiotic-free can add confusion. These labels may impact consumer decision making. Consider the USDA definitions of these terms below:

* USDA organic: USDA organic standards are set by the USDA and determine how farmers and ranchers raise their animals and the materials they may use. Organic foods must be raised without: synthetic fertilizers, some pesticides, genetically modified ingredients. Organic meat standards prohibit the use of synthetic hormones and antibiotics and regulate the welfare conditions of the animals.
* Natural: On meat products, the natural label means “minimally processed.”
* Grass-fed: the diet of the animal is comprised solely of grasses and forages, animals must have access to pasture for the entire growing season, and cannot be fed grain or grain by-products.
* Cage-free: the flock was able to move freely about an enclosed area with unlimited access to fresh water and food.
* Free-range: the flock was given shelter in a building or area with unlimited access to food, fresh water, and the outdoors.
* Hormone-free: On beef products, a “no hormones administered” label may be used if documentation is presented to the USDA signifying that no growth hormones were used in the production of the beef animal. *No hormones are allowed in the raising of hogs or poultry,* so a “no hormones added” label is allowed *only* if followed by “Federal regulations prohibit the use of hormones.”
* Antibiotic-free: sufficient documentation was presented to the USDA that the animal was not treated with antibiotics.

# Interest Approach or Motivator:

 Discuss with students:

* Why is it important to read food labels?
* What is in processed food?
* What is processed food?
* Why do we process food?

# Procedures (outline the main points, step by step activities, and the full content to be presented to students)

1. Place food items on five tables according to their category.
2. Place students into teams of 3-4.
3. Pass out one Food Breakdown Worksheet to each group. Explain that teams will be competing to create the healthiest meal out of the processed food items on the tables. Each meal must contain an item from four out of the five tables. On the worksheet, students must record the vital information on each item they choose and an explanation as to why their meal is the healthies available.
4. After 5-10 minutes of students exploring the food items, group members should prepare a short (2-3 minute) presentation of their meal.
5. As each group has presented, discuss with students:
	* Where on a food label or nutrition label should you look for the nutritional value of a food item?
	* What are some foods that might be healthier than the ones offered on the tables? Why might they be healthier?
	* Were these foods processed? Why would they be considered processed?
	* What other information was presented on the label? How might this information impact consumer buying choices?
	* If you hadn’t been instructed to choose only healthy foods, how would your choices have differed?
	* Are all processed foods bad? Does processing ever add value (economically or nutritionally) to a product?

# Essential Files (maps, charts, pictures, or documents)

* Food Breakdown Worksheet

# Extension Activities (how can students extend learning outside of the classroom? This could include assignments they do outside of class.)

* Students will come up with a meal plan for a day that is low and high in processed food. The meal plan should include breakfast, lunch and dinner.

# Sources/Credits/Citations

## Agriculture Literacy Outcomes

Food, Health and Lifestyle Outcomes:

* Accurately read labels on processed food to determine nutrition content
* Explain food labeling terminology related to marketing and how it affects consumer choices (e.g., natural, free range, certified organic, conventional, cage-free, zera trans-fat, sugar-free, reduced calorie)
* Identify how various foods can contribute to a healthy diet
* Describe the nutritional value that can be added by processing foods

Science, Technology, Engineering & Mathematics Outcomes

* Provide examples of how processing adds value to agricultural goods and fosters economic growth both locally and globally