Nebraska Corn Board
Funding Proposal
FY 2015-2016
Submitted May 26, 2015
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Festival Outcomes
✓ Youth will know where their food comes from.
✓ Youth will develop positive attitudes and interests regarding local agriculture.
✓ Youth will utilize scientific principles as they apply to agriculture.

Festival Underlying Principles
✓ Agriculture festivals will support Agriculture Literacy outcomes.
✓ There is consistency among agriculture festivals statewide.
✓ Stakeholder needs will be met.

Learning Objectives – CORN & SOYBEAN PRODUCTS Session
✓ Youth will be able to determine what products they use in their lives are from corn and soybeans.
✓ Youth will be able to explain how corn and soybeans are used for different purposes (human/animal/energy)

Learning Objectives – CORN & SOYBEAN PRODUCTION Session
✓ Youth will be able to recognize the corn and soybean production cycles.
✓ Youth will be able to identify the science behind the Plant Life Cycle.
✓ Youth will be able to apply math utilizing corn and soybean production statistics.

Learning Objectives – AGRICULTURE TECHNOLOGY Session
✓ Youth will be able to explain the progression of agriculture technology and how it affects corn and soybean production.
✓ Youth will be able to identify the importance of technology in agriculture to help farmers feed the world.
Curriculum (SEE ATTACHED)

- 15 to 20-minute lessons (Lessons include script, PowerPoint, storyboard visual aids, and list of other visuals)

- Lesson Topics:
  - Agriculture Technology*
  - Corn/Soybean Production*
  - Corn/Soybean Products*
  - Pigs/Pork
  - Beef
  - Dairy

- Additional lessons can be added based on local needs.

- If time allows, students will be briefed as an entire group after attending their final session. Part of the discussion includes encouraging the youth (and their teachers) to be more aware of the products they consume. (IE: “When you are in the grocery store with an adult, look at labels and check out the ingredients - look to see if the products contain corn and/or soybeans.”) Also, they are encouraged to tell at least two persons two different things that they learned from attending the Ag Literacy Festival. This provides an opportunity of reflection.

What is the soybean message conveyed & how does your proposed project tie directly to soybeans?

Ag Literacy Festivals across the state of Nebraska provide education to youth who will share information with their family members as well as become adult consumers.

The program's outcomes are the following:

- Youth will know where their food comes from.
- Youth will develop positive attitudes and interests regarding local agriculture.
- Youth will utilize scientific principles as they apply to agriculture.

The goal is to increase youth’s knowledge and understanding about agriculture concepts that includes a better understanding of our area’s consistent supply of quality commodities and value-adding industries. As a result, youth will be better informed about the role agriculture plays in the state and local economy as well as in their daily lives.
TARGET AUDIENCE

3rd & 4th Grade Students

<table>
<thead>
<tr>
<th>County of Participating Students</th>
<th>Location Festival is Held</th>
<th>Date:</th>
<th># of Students</th>
<th>UNL Extension contact:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffalo</td>
<td>Kearney</td>
<td>April</td>
<td>475</td>
<td>Kerry Elsa</td>
</tr>
<tr>
<td>Buffalo, Kearney, Franklin</td>
<td>Kearney</td>
<td>April</td>
<td>150</td>
<td>Kerry Elsa</td>
</tr>
<tr>
<td>Burt, Dodge, Douglas &amp; Washington</td>
<td>Washington County Fairgrounds, Arlington</td>
<td>April and/or May</td>
<td>700-800</td>
<td>Tracy J Behnken</td>
</tr>
<tr>
<td>Douglas and Saunders and Lancaster</td>
<td>Lancaster Event Center and the ARDC</td>
<td>April and October</td>
<td>1000-1600</td>
<td>Monte Stauffer &amp; Karna Dam</td>
</tr>
<tr>
<td>Fillmore, Thayer, Nuckolls, sometimes Clay</td>
<td>Geneva</td>
<td>September</td>
<td>125-175</td>
<td>Brandy VanDeWalle</td>
</tr>
<tr>
<td>Holt/Boyd</td>
<td>O’Neill</td>
<td>October</td>
<td>100</td>
<td>Megan Hanefeldt</td>
</tr>
<tr>
<td>Jefferson</td>
<td>Fairbury</td>
<td>May</td>
<td>80-100</td>
<td>Darci Pesek</td>
</tr>
<tr>
<td>Lincoln, Logan, McPherson</td>
<td>North Platte</td>
<td>October</td>
<td>150-300</td>
<td>Cathy Weaver</td>
</tr>
<tr>
<td>Madison</td>
<td>Madison County Fairgrounds</td>
<td>October</td>
<td>400</td>
<td>Sarah Polacek</td>
</tr>
<tr>
<td>Rock</td>
<td>Bassett Grade School</td>
<td>February</td>
<td>80</td>
<td>Pamela Bauer</td>
</tr>
<tr>
<td>Scottsbluff, Sioux, Dawes, Sheridan, Central Sandhills (Blaine, Grant, Hooker, Thomas), Box Butte, Cherry, Kimball, Banner, Cheyenne, Morrill</td>
<td>There are several locations being considered as this is a new Festival. We will choose 2 to 3 locations across our district to best meet the needs of the students</td>
<td>TBD</td>
<td>Total number of students this could impact is 2,125 students</td>
<td>Deb Kraenow or Jana Schwartz</td>
</tr>
<tr>
<td>Thurston &amp; Clay</td>
<td>Cuming County Fairgrounds</td>
<td>TBD</td>
<td>TBD</td>
<td>Jennifer Hansen</td>
</tr>
<tr>
<td>Webster</td>
<td>Blue Hill Elementary</td>
<td>November</td>
<td>40</td>
<td>Carol Kumke</td>
</tr>
</tbody>
</table>

Total (Potential) Students 5,345-6,445

The 4-H Ag Festival team is currently in the process of developing a format for Nebraska Extension faculty/staff to request funds in accordance with the state commodity boards’ procedures. The plan is to have a system in place by June 2015.

PROGRESS/SUCCESS MEASURED

✓ Teachers will be required to complete an evaluation form that includes each session. They are to evaluate the "Increase in Knowledge" for the students in their class for each of the sessions (includes “Corn and Soybean Production”, “Corn and Soybean Products” and “Ag Technology”). Teachers also provide essay question responses regarding the festival’s positive impact on their students.

✓ Festivals organizers (Extension faculty/staff) will individual administer the evaluation form to the teachers attending the festival at their site. Results will be submitted to a state data base as well as per request for funds.

✓ Annually a state-wide Ag Literacy Festival report will be included in the funding proposal request.

✓ Evaluation tool is enclosed.
The Agricultural Literacy 4-H Action Team plans to generate additional proposals for other Nebraska commodities and stakeholders based on their requested guidelines. In addition, individual festival organizers may seek local commodity groups, Farm Bureaus, and agri-businesses. In many cases, the festival budget could be more than $5 per student. At this time, the Nebraska Corn Board and the Nebraska Pork Producers Association have granted funds for the 2015-2016 school year.

Estimate the % of Nebraska Soybean Board’s funding commitment towards this total project.
18% - Based on $5.50 per student and $1 funding request.

PROPOSED BUDGET SUMMARY:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost per Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session Supplies</td>
<td>$1/student</td>
</tr>
<tr>
<td>Product Samples</td>
<td>$1/student</td>
</tr>
<tr>
<td>Mileage Stipend for Non-UNL Presenters</td>
<td>$0.50/student</td>
</tr>
<tr>
<td>Mileage Stipend for Producers</td>
<td>$0.50/student</td>
</tr>
<tr>
<td>Lunch/Refreshments for Volunteers</td>
<td>$0.50/student</td>
</tr>
<tr>
<td>Student Transportation</td>
<td>$2/student</td>
</tr>
</tbody>
</table>

**TOTAL = $5.50 / STUDENT**

ATTACHMENTS

- ✔ Curriculum for Ag Technology
- ✔ Curriculum for Corn & Soybean Production
- ✔ Curriculum for Corn & Soybean Products
- ✔ Example of Corn & Soybean inclusion in other sessions: Beef Production
- ✔ Evaluation Form
Agriculture Technology Session
Nebraska 4-H Agriculture Festival

Brief Description: Through utilization of the agriculture technology poster series students will see the progression of agriculture technology and how it affects corn and soybean production. Upon conclusion of the presentation students will be able to identify the importance of technology in agriculture and how it helps farmers feed the world.

Materials List/Supplies:
• 5 Easels if using posters
• Projector and screen if using PowerPoint
• Posters or PowerPoint
  ✓ How big is an acre?
  ✓ Bushels of Corn
  ✓ Equipment and Costs
  ✓ Hours of Work
  ✓ Feeding the World
• Additional visuals may include: bushel basket, ears of corn, bucket of soybeans, piece of current and past equipment, etc.
• To enhance the session, ask that a local implement dealer and/or farmer bring (the newest) equipment. Allow the students to sit in the cab/seat of the equipment. In addition, encourage the dealer or farmer to share information about technology (GPS) and its importance to agriculture.

Outcome:
• Youth will know where their food comes from.
• Youth will develop positive attitudes and interests regarding local agriculture.
• Youth will utilize scientific principles as they apply to agriculture.

Learner Objectives:
• Youth are able to explain the progression of agriculture technology and how it affects corn and soybean production.
• Youth are able to identify the importance of technology in agriculture to help farmers feed the world.
TEACHING THROUGH POSTER SERIES:

✓ Use easels to display all of the posters. NOTE: Do not display the “How Big is An Acre” at the start of the session.
✓ Apply all of the tags (with Velcro) to the posters prior to the student arrival.
✓ Additional visuals may include: bushel basket, ears of corn, bucket of soybeans, piece of current and past equipment, etc.
✓ To enhance the session, ask that a local implement dealer and/or farmer bring (the newest) equipment. Allow the students to sit in the cab/seat of the equipment. In addition, encourage the dealer or farmer to share information about technology (GPS) and its importance to agriculture.

POSTER 1: “HOW BIG IS AN ACRE”

• Begin by asking the students if they know (or can guess) how big an acre is.
• Once you have had several guesses OR the correct answer, turn the poster over and talk about it. Let them know how acres are used as a common term for land in agriculture and how it is just smaller than a football field.

Discuss how TECHNOLOGY has changed and helped agriculture be more productive. The series of posters allow the students to understand technology over the past 150+ years – from 1850 to today (in 40 year increments).

POSTER 2: “BUSHELS of CORN”

OPTION: If you have plenty of time, also cover the kernels in the “Ag Technology” column. If you have less time, leave the kernel information revealed and discuss it as you move down the poster through the years. The kernels explain why production did or did not increase over the 40-year increments.

• Explain and refer to the timeline that was used to create the poster – 1850 to today (every 40 years).
• Explain how big a bushel is OR best is to have a bushel basket so they can visually see it.
• Start with 1850 and ask the students to guess how many bushels of corn per acre were produced in 1850.
• CONTINUE the process with the other dates: 1890, 1930, 1970 and today. The student will most likely guess a higher number for 1890 and 1930 and may be surprise of the same amount produced. NOTE: 1900 – 1920: Farmers went to “Corn Shows” at county and state fairs. The ears of corn were judged on uniform appearance and NOT bushels of corn per acre.
CONTINUE the process with the other dates: 1890, 1930, 1970 and today. Be sure to discuss and refer to the (column) kernels of Ag Technology History.

AG TECHNOLOGY HISTORY:
1900 – 1920: Farmers went to “Corn Shows” at county and state fairs. The ears of corn were judged on uniform appearance and NOT bushels of corn per acre.
1920s - 1930s: Fertilizers were developed and were used to increase production – bushels of corn per acre. Tractors and other mechanized tools also appeared during this time.
1930s - 1940s: Scientists observed pollination of corn plants and started developing better seed corn called HYBRIDS that produced more corn per acre.
1950s – 1960s: The center pivot irrigation system was being developed in Nebraska. Irrigation helped increase production – more corn per acre.
TODAY: Scientists continue to research better ways to increase corn production in order to feed the growing world population.

For the final date “TODAY”, be sure to point out to the students that Nebraska has a higher (by 10 bushels) production average then the national average. Have the students give a cheer and be proud of Nebraska agriculture!

POSTER 3: “EQUIPMENT & COSTS”
• Discuss how technology of equipment has changed over the years.
• Start with 1850 and point out what equipment/technology was used (in the white box).
• Ask the students to guess what a horse was worth in 1850. Once you had one (or a few guesses), remove the tag from the poster to reveal the price.
• CONTINUE the process with the other dates: 1890, 1930, 1970 and today. Discuss inflation over the years. Also discuss HORSEPOWER and how the increased size of the tractor allowed the farmer to use increased size of the equipment listed (in the white boxes).
• NOTE: The tractors pictured/priced and the equipment listed (in the white boxes) are the average for the year listed.
POSTER 4: “HOURS of WORK”
- The poster reflects the same timeline (1890-today) and highlights how many hours of work it takes to produce one acre of corn – from tilling to harvest.
- Remind the students how technology effected equipment and how that had an impact on labor (work).
- Start with what they can identify with – hours of an average school day (7).
- Then begin with 1850 and have the students guess the number of hours it took to produce one acre (referring to “ACRE” poster). Ask one student to guess and have him/her remove the tag from the poster to reveal the hours.
- CONTINUE the process with the other dates: 1890, 1930, 1970 and today. Be sure to discuss how TECHNOLOGY has increased productivity that will help us to feed the growing world.

POSTER 5: “FEEDING THE WORLD”
NOTE: If time is short, this poster could be quickly discussed.
- Today’s world population is 7B and projected to be 9B by the year 2050.
- Compare the “US Population” to the “Farmers in the US” and how the percentage of farmers is decreasing in part due to technology and efficiency. TODAY – 2% of the population is US farmers and in Nebraska 5% of the population are farmers.
- Refer to the “US Farmer Feeds” column and how ag technology has increased production.
- HOWEVER, share with the students that the population growth puts an increase demand on ag technology in order for us to feed the world. Ag technology includes – equipment, animal and plant genetics, fuel efficiencies, product and by-product development, water usage efficiencies, etc. … include more based on your knowledge and background.
HOW BIG IS AN ACRE?

43,560 square feet
Almost the size of a football field. Outlined in RED.
**Bushels of Corn**

1 bushel of corn = 56 pounds

**Ag Technology**

1900 - 1920
Farmers went to "Corn Shows" at county and state fairs. The ears of corn were judged on uniform appearance and NOT bushels of corn per acre.

1920s - 1930s
Fertilizers were developed and were used to increase production - bushels of corn per acre. Tractors and other mechanized tools also appeared during this time.

1930s - 1940s
Scientists observed pollination of corn plants and started developing better seed corn called HYBRIDS that produced more corn per acre.

1950s - 1960s
The center pivot irrigation system was being developed in Nebraska. Irrigation helped increase production - more corn per acre.

**Timeline**

<table>
<thead>
<tr>
<th>Year</th>
<th>Bushels of Corn per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850</td>
<td>25</td>
</tr>
<tr>
<td>1890</td>
<td>25</td>
</tr>
<tr>
<td>1930</td>
<td>25</td>
</tr>
<tr>
<td>1970</td>
<td>89</td>
</tr>
<tr>
<td>TODAY</td>
<td>160</td>
</tr>
</tbody>
</table>

**Bushels of Corn per Acre**

In Nebraska (+10 bushels) = 170
How many bushels?

How many bushels?

How many bushels?

How many bushels?
How many bushels?

How many bushels?
1900 - 1920
What was going on?

1920s – 1930s
What was going on?
1950s - 1960s
What was going on?

1930s - 1940s
What was going on?
TODAY
What is going on?
EQUIPMENT & COSTS
Used for Planting and Harvesting Corn & Soybeans

TIMELINE

1850
- Horses
- Walking Plow & Harrow
- Hand Planting

Horse = $20

1890
- Horses
- Gang Plow
- Harrow
- Seeder
- Wagons

Horse = $65

1930
- Tractor = $1,000
- 25 Horsepower
- 2-bottom Gang Plow
- 7-foot Tandem Disk
- 4-section Harrow
- 2-row Planter
- Cultivator
- Picker
- Wagons & Trucks

1970
- Tractors
  - 5-bottom Plow
  - 20-foot Tandem Disk
  - 4-row Planter
  - 20-foot Herbicide Applicator
  - 12-foot Self-propelled Combine
- Wagons & Trucks

TODAY
- Tractor = $175,000
- 225 Horsepower
- Tractors
  - 36-foot Disk/Harrow
  - 40-foot long, 16-row Planter
  - 100-foot Herbicide Applicator
  - 30-foot Self-propelled Combine
- Wagons, Trucks & Semi-trucks
Tractor = $1,000
25 Horsepower

Tractor = $10,500
95 Horsepower

Tractor = $175,000
225 Horsepower

10.2014
HOURS of WORK to produce one acre of corn.

AVERAGE SCHOOL DAY
8:00 a.m. – 3:00 p.m.

TIMELINE

1850
32 hours

1890
16 hours

1930
8 hours

1970
3 hours

TODAY
1 hour
How many hours?
FEEDING THE WORLD

TIMELINE

1850 → 23,200,000 → 11,680,000 → 4 people*
1890 → 62,900,000 → 29,400,000 → 6 people*
1930 → 122,800,000 → 30,500,000 → 10 people*
1970 → 204,300,000 → 9,700,000 → 72 people
TODAY → 313,000,000 → 6,260,000 → 155 people

U.S. POPULATION

FARMERS IN U.S.

WORLD POPULATION

Today = 7,000,000,000
2050 = 9,000,000,000

WORLDWIDE ONE (1)

U.S. FARMER FED/FEEDS

*Methodology of data collection unknown.
PEOPLE FED BY ONE U.S. FARMER

PEOPLE FED BY ONE U.S. FARMER

PEOPLE FED BY ONE U.S. FARMER

PEOPLE FED BY ONE U.S. FARMER

PEOPLE FED BY ONE U.S. FARMER
FARMERS in U.S.

FARMERS in U.S.

FARMERS in U.S.

FARMERS in U.S.

FARMERS in NEBRASKA
Corn & Soybean Production
Nebraska 4-H Agriculture Festival

Brief Description: Students will learn about the corn and soybean production cycles and be able to identify the plant life cycle. In this presentation students will utilize math skills to explore corn and soybean statistics.

Materials List/Supplies:
- Easel if using posters
- Projector, screen and speakers if using PowerPoint
- Posters or PowerPoint-
  - One Farmer Feeds
  - How much is an acre?
  - Corn Stats
  - Bushels of Corn
  - Soybean Bushels/Pods/Seeds
  - Crop Production
- Additional visuals may include: bushel basket, corn plant, soybean plant, (or silk corn and soybean plans) ears of corn, bucket of soybeans

Outcome:
- Youth will know where their food comes from.
- Youth will develop positive attitudes and interests regarding local agriculture.
- Youth will utilize scientific principles as they apply to agriculture.

Learner Objectives:
- Youth are able to recognize the corn and soybean production cycles.
- Youth are able to identify the science behind the Plant Life Cycle.
- Youth are able to apply math utilizing corn and soybean production statistics.

Background Information:
- Use easels to display the posters.

Anticipatory Set:
Slide 1: Agriculture is very important to the State of Nebraska. 93% of the land in Nebraska is used for agriculture (either farming or ranching). There are parts of Nebraska where it is either too hot or too dry, the soil is too sandy, and can’t raise food crops but can grow grass to feed animals.

The average size of a Nebraska Farm is 500 to 1000 acres. We will talk about an acre in a minute.
One farmer can raise enough food to feed 155 people and after we talk about agriculture I think you will be able to understand how 1 farmer can feed that many people.

**Slide 2:** Can anyone tell me “What is an Acre”? An acre is about the size of a Football Field. There is another definition of an acre and that is what a farmer uses most often. The mathematical definition for an acre is 43,560 square feet. If you take a square foot, it is one foot tall by one foot wide and start counting on the corner of the football field when you get to 43,560 square feet that will be one acre.

**Activity, Content & Instructions:**

**Slide 3.** We will talk about corn first. We plant about 95 million acres of corn in the USA. In Nebraska we plant about 10 million acres of corn. We plant about 30,000 kernels of corn on an acre (football field). We harvest corn in September – October.

When we talk about soybeans we plant about 76 million acres of soybeans in the USA. In Nebraska we plant 5 million acres of soybeans. We plant more corn in Nebraska because corn can grow better on sandy soils and we have some Nebraska soils that contain a lot of sand.

**Slide 4.** Let’s pretend that a farmer takes one kernel of corn. When does the farmer plant corn? In the spring, late April or early May. If the farmer plants 30,000 kernels of corn how many ears will the farmer get? (Show corn plant with one ear on it.) The farmer would get 30,000 ears. How many kernels of corn do you get from one ear? 450 kernels. If we multiply 30,000 kernels times 450 kernels per ear how many kernels do we get from one acre? We get 10,920,000 kernels per acre.

We need to talk about another definition. What is a bushel? A bushel is important because that is how a farmer sells their corn and soybean and other food items. A bushel is about the size of a small laundry basket. (Show bushel basket if one is available) A bushel basket is always the same size (a volume). Can you tell me how many pounds of corn there is in one bushel? There is a mathematical definition for a bushel of corn and it is 56 pounds of corn per bushel. If a farmer sell his corn anywhere is the U.S. the buyer know they are getting 56 pound of corn. Can someone tell me how much money a farmer will get for 1 bushel of corn? (Current Market Price) If a farmer gets $4 for each bushel and a farmer can raise 150 bushels on an acre how many dollars can a farmer get for all the corn from one acre? ($600 or whatever the answer is) (You can ask the youth to calculate the amount of total dollars if they are old enough).

**Slide 5.** Over the years when farmers first started to grow corn they wanted ears that looked good and were large. In 1850 a farmer could raise about 25 bushels of corn per acre. In 1890 and 1930 they could raise about the same 25 bushel. Farmers then decided that they could get more money if they looked at how much they raised and not how the ears looks and hybrid seed corn was developed. Farmers could raise about 89 bushels per acre by 1970. As fertilizer and hybrid seed was improved farmers increased the amount of corn they could raise to about 125 bushels per acre across the U.S. and in Nebraska a farmer can raise about 160 bushels of corn today.
Slide 6. Now let’s compare raising soybeans to raising corn. When a farmer raises soybeans what do they get when they plant a soybean seed? Do they get ears of soybeans? No they get pods. Do they get one ear per plant? No they get about 20 pods per plant and in the pod they get 3 seeds per pod. A farmer plants about 150,000 seed per acre (football field). Compare the 150,000 soybean seeds per acre with the 30,000 seeds for corn. Since the soybean plants are smaller you can plant more plants per acre for soybeans. We multiply 60 seeds per plant by 150,000 seeds per acre you get 8,400,000 seeds per acre. Compare corn at about 11 million kernels and 8.5 million soybean seeds. Since the farmer would like to get about the same amount of money for the two crops we know that we will need more dollars per bushel if the farmer is going to raise soybeans. We have the same bushel basket and when we fill it with soybeans how many pounds will a bushel of soybeans hold? The mathematical definition for a bushel of soybeans is 60 pounds. Anywhere a farmer sells a bushel of soybean in the U.S. it will always be 60 pounds. How much will a farmer get when they sell a bushel of soybeans? (Current market price times 50 bushels per acre). If a farmer raises 50 bushels of soybeans per acre how much will they get for the soybeans from the acre? If the market is $14.00 per bushel and you multiply 50 bushels per acre the farmer can get about $600 for an acre of soybeans. About the same as for corn.

Slide 7. The $600 per acre is not total profit. The farmer has to buy fuel, seed, fertilizer and equipment to plant and harvest the crops.

There is another reason farmers like to plant soybeans. Soybeans can make their own fertilizer. The soybean plant belongs to a family of plant called legumes. Legumes can absorb nitrogen out of the air that we breathe and take the nitrogen into the leaves, down the stems and into the roots where there are bacteria called rhizobia that make nodules on the roots that produce fertilizer. Not only can the soybean make enough fertilizer to grow itself it leaves some fertilizer in the soil after harvest so the next crop can use it. That is why a farmer likes to do something called rotation of crops. The farmer can plant soybeans then corn then soybeans then corn etc. That way the corn crop can use the fertilizer left from the soybeans the year before.

The corn and soybean plants do other things for us as well. Can someone tell me what is the process when plants use sunlight energy along with chlorophyll to produce plant material? Photosynthesis. If we stand in the sun all we get is sunburned but plant can use the sunlight energy to produce food for us.

The plants also do something else. Can someone tell me what is the name of the gas in the air that we breathe out and that plants take in? Co2. Carbon dioxide is a greenhouse gas and plants can take the carbon dioxide out of the air and put it into the plant. This process has a big long name: carbon sequestration. That means that plants can take carbon out of the air and tie it up in the plants in the carbon cycle.
The plants can also do another thing. Can someone tell me what is the gas in the air that we breathe in that plants give off? Oxygen. So plants do a lot of things besides just product food for us. They can do photosynthesis, take carbon out of the air we breathe and put oxygen back into the air we breathe.

**Slide 8.** Here is a short video clip that shows how a farmer plants corn and soybeans. The planter plants the crops in rows. I want you to watch for the computer in the tractor cab that counts the number of seeds the farmer is planting. The planter has electric eyes that count the number of seeds the farmer is planting per acre so the farmer can adjust the number of seeds so they get 30,000 kernels of corn and 150,000 soybean seeds.

**Slide 9.** Here is a short video clip that shows how a farmer harvests soybeans. Notice the front head on the combine. We use the same machine called a combine to harvest corn and soybeans. The soybean head cuts the whole plant and takes it into the machine where it rubs the plants together and lets the heavy seed drop to the bottom of the machine and then is placed in the bin on top of the machine. The light material is blown out the back of the machine by a big fan.

**Slide 10.** Here is a short video clip that shows a farmer harvesting corn. Notice the front head on the combine. It has something called snoots that travel between the rows of corn and just pull the ear off the plant. Only the ear is taken into the combine. The ears of corn are rubbed together and the heavy grain drops into the bottom of the machine. It is then moved into the bin on top of the machine. (The dark sided thing on the top of the combine). The light material is blown out the back of the machine by a big fan. The combine then drives up to a grain cart (wagon) and then the grain cart dumps the grain into a truck that takes the grain to the elevator where the farmer can sell it.

I hope you have had a good time at the Ag Literacy Festival and this will help you understand how one farmer can produce enough food to feed 155 people.

**Reflection Using the Experiential Learning Model:**

**Share/Process:**
- *What is photosynthesis?*
- *Why do farmers rotate corn and soybeans?*

**Generalize:**
- *How are corn and soybeans different?*
- *How are they the same?*

**Apply:**
- *What does this matter to us? Why is this important?*
- *What kinds of skills do farmers need to be good at?*
93% of Nebraska’s Land is used for Farming and Ranching.

The average farm size is 500-1,000 acres.

One farmer produces enough food to feed 129 people.
HOW BIG IS AN ACRE?
95 million acres planted in USA

10 million acres planted in Nebr.

Planted
Late April to Mid-May
30,000 seeds per acre

Harvested in September-October

76 million acres planted in USA

5 million acres planted in Nebr.

Planted
Mid-May to Mid-June
150,000 seeds per acre

Harvested in September-October
**Ag Technology**

**1900 - 1920**
Farmers went to “Corn Shows” at county and state fairs. The ears of corn were judged on uniform appearance and NOT bushels of corn per acre.

**1920s - 1930s**
Scientists observed pollination of corn plants and started developing better seed corn called HYBRIDS that produced more corn per acre.

**1950s - 1960s**
The center pivot irrigation system was being developed in Nebraska. Irrigation helped increase production – more corn per acre.

**Timeline**

- **1850**

- **1890**

- **1930**

- **1970**

- **TODAY**

**Bushels of Corn per Acre**

- **1850**
- 25 bushels

- **1890**
- 25 bushels

- **1930**
- 25 bushels

- **1970**
- 89 bushels

- **TODAY**
- 125 bushels

**In Nebraska PLUS**
- 160 bushels

1 bushel of corn = 56 pounds

= 10 bushels
THE SOYBEAN

- Pods per plant: 20
- Seeds inside: 3
- Seeds per plant: 60
- Seeds per acre: 8,400,000
- Bushels per acre: 50
- Pounds per bushel: 60
- Pounds per acre: 3,000
- Seeds per pound: 2,800
- Control weeds & fertilize
- Get the soil ready to plant
- Plant
- Control weeds and insects
- Irrigate
- Harvest
- Sell, store, or make the crop into food and byproducts

Crops need sunlight, water, nutrients, and carbon dioxide to grow.

Soil is the “grocery store”. It is where the roots absorb nutrients & water.

Crops release oxygen into the atmosphere that is used by people and animals.

$ - Land, Taxes, Equipment, Fuel, Labor, Insurance, Chemicals, Irrigation, Fertilizer, Seed
Corn & Soybean Products
Nebraska 4-H Agriculture Festival

**Brief Description:** Do you know what is in that snack you are eating? Is that made for a human or animal? Answer these questions and more as you dig deeper into all of the by-products made from corn and soybean!

**Grade Level:** 3rd-5th grades

**Skills:** Students will be able to identify what daily products they use have corn and/or soybean by-products in them. They will also be able to differentiate between human, animal, and energy consumption.

**Materials List/Supplies:**
- 2 sets of by-product pictures (25 pictures per set; one or two sets depending on group size)
- Answer Key
- Tape
- Real-life examples of by-products (optional)
- PowerPoint (optional)

**Time Needed:** 20 minutes (can easily lengthen by expanding discussion after each round)

**Nebraska Education Standard(s):**
SC5.4.2.c: Identify how Earth materials are used (fuels, building materials, sustaining plant life)
SC5.1.2.b: Recognize that new discoveries are always being made which impact scientific knowledge

**Outcome:**
- Youth will know where their food comes from.
- Youth will develop positive attitudes and interests regarding local agriculture.
- Youth will utilize scientific principles as they apply to agriculture.

**Learner Objectives:**
- Youth will be able to determine what products they use in their lives are from corn and soybeans.
- Youth will be able to explain how different by-products are used for different purposes (human/animal/energy)
Vocabulary:
- By-products
- Consumption
- Energy
- Human
- Animal

Life Skills:  Teamwork, Self-motivation, self-discipline, healthy lifestyle choices, learning to learn, decision making, problem solving, critical thinking, wise use of resources, communication, cooperation, social skills

Suggested Group Size:  20-50

Background Information:  Provide additional information for instructors teaching your lesson. Include anything that someone outside of the field you are developing a lesson plan for may need to know or understand better.

Anticipatory Set:  Presenters can have a variety of products to display. Some can be made from corn by-products, some with soybean by-products, and some that contain both. Pass out the products and have youth in groups of 2-3 explain what they use that product for and what they know about it. Lead discussion toward how each of these products contains corn and/or soybean by-products.

Activity, Content & Instructions:
Introduction of Presenters (2 min)
Anticipatory Set visuals (3 min)
Pass out pictures to students (2 min)
Round 1 (1 min)
Round 1 Discussion (4 min)
Round 2 (1 min)
Round 2 Discussion (4 min)
Wrap-Up/Review/Questions (3 min)

In round 1, direct students to determine what their product is made of (majority), they must decide if they are a by-product of corn or soybeans. Give them two spots to stand based on their contents.

Discuss 10-15 of the products if they are in the right category or not. If you have a longer session, you can charge the groups with the responsibility to review everyone in their group and make sure they belong there.

In round 2, direct students to three different corners. One is if they are used for human consumption, one for animal consumption, and one for energy consumption.

Discuss 10-15 different products (make sure you discuss each student’s product in at least one session). Ex. What kind of animals consume this product? What type of energy uses this product?
Reflection using the Experiential Learning Model- Providing an experience alone does not create experiential learning. Experiences lead to learning if the participant understands what happened, sees patterns of observations, generalizes from those observations and understands how to use the generalization again in a new situation. Write questions to ensure reflection. Share: the results, reactions, observations publicly. Process: by discussing, looking at the experience; analyze, reflect. Generalize: to connect the experience to real-world examples. Apply: what was learned to a similar or different situation

Share:
Questions should address:
* How did we first organize our products?
* What part of the experience was the most difficult?
* What was the easiest for you?
* How did we organize our products the second time?

Process:
Questions should address:
* How did you determine if your product was made with corn or soybeans?
* How did you decide what consumption process your product was used for?
* Why is it important to make a decision?

Generalize:
Questions should address:
* Why is it important to know what is in the products we use and food we eat?
* What are some other products you think have corn and/or soybeans in them?
* What similar experiences they have had with having to make a decision like you did today?

Apply:
Questions should address:
* What is one product you will go home and look to see if it has corn and/or soybeans in it?
* How they can use what they learned?

Conclusion/Final Instructions: Have each student tell you one product they remember from today and if it is used for human, animal, or energy consumption as they leave. If you are short on time, pick three to five pictures to hold up one at a time and have students tell you as a group.

References: Use APA to cite any references you used in designing your lesson plan.


Retrieved from http://www.clipartsfree.net/tag/bot.html

Nebraska 4-H Agriculture Festival

Corn & Soybean Products

University of Nebraska–Lincoln

What do these items have in common?

University of Nebraska–Lincoln
Corn and Soybean Product Highlights

- Corn is a key ingredient in over 4,200 products!
- Soybean oil is used in many products such as ink, paints, soaps and cosmetics!
- Nebraska is the top popcorn producing state!
- 5th largest soybean producing state
Uses: Corn & Soybean Products

People
Animals
Energy

University of Nebraska–Lincoln

Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln cooperating with the Counties and the United States Department of Agriculture.

The 4-H Youth Development program abides with the nondiscrimination policies of the University of Nebraska–Lincoln and the United States Department of Agriculture.

University of Nebraska–Lincoln
WILDLIFE FORMULA
CRUNCH N’ NUT™
SQUIRREL FOOD

A special blend of premium ingredients for squirrels and other wildlife.

Attracts squirrels, chipmunks, rabbits and other backyard wildlife.
Nature-fil
Environmentally Friendly
All Natural Premium Fibers

Made from annually renewable resources
Hypo-allergenic
Washable in pro guarantted
conditionals
ECO FIN

CEDAR TONE

Maximum UV Protection

Does not exceed 100 Grams/Liter VOC

Batch # 06-3442

1 GALLON

Exterior & Interior Wood Finish

Soy Oil Based, Low VOC Wood Sealer

and, with pigment added, Stain,

No Petroleum Oils & Minimal VOC Solvents

Improve Beauty and sheds water to extend roof life.

For fences, roofs, deckings, sidings, logs, wood furniture, ceilings & beams, etc.

Provides performance & responsibility.
KAYTEE

Gourmet Variety Diet

with DHA, Omega-3 & Probiotics Plus Fun Variety Mix

NET WT 2.5 LB (1.13 kg)
Bio-Food Grade E.P. Grease
NLGI # 2 (High Temperature)

"Bio-based Lubricants that Perform Like Synthetics"

Bio-Food Grade E.P. Grease is a high temperature bio-based grease with excellent E.P. and antioxidant performance. The high oxidative stability of the Stabilized™ 1030S technology improves the thermal shear stability and load capacity. It is non-toxic and made by food processing and packaging machinery. Bio-Food Grade E.P. Grease is a rust and oxidation inhibiting formula that is very non-toxic to human. This product provides superior high temperature performance and good adhesion/retention properties. Like most other ant-seize products, it is not intended for use as bearing grease. It is a superior High Temperature Food Grade Grease with good cold temperature stability.

35 lb. Pail

BATCH NUMBER:
Renewable Lubricants, Inc.
818 Gage Rd
Norwalk, OH 44652
216-877-8922 Fax: 216-877-2266

FIRST AID:
EYE CONTACT: Flush with large amounts of water for at least 15 minutes.
SKIN CONTACT: Wash exposed portions with soap and water.
INGESTION: DO NOT INDUCE VOMITION.
Beef Production Example
Nebraska 4-H Agriculture Festival

Learner Objectives:
• Youth can summarize the beef production cycle.
• Youth can recognize beef products and by-products.

Slide 13:
In May or early June we are going to move our cows and calves to pasture. We are so lucky in Nebraska that we have good quality pasture grass that our animals can get all of the nutrients they need most of the summer. As long as we provide them with good fresh water every day, they are very happy in the pasture.

The calves will nurse from their mothers and then in mid-summer we will put creep feed out for our calves. Creep feed helps them learn how to eat grain and teaches their belly how to digest grain. Creep feed is a sweet feed that they like to eat.

Slide 16:
We feed them 1 – 3 times per day depending on the routine of the feedlot. The feed they eat is generally made up of corn which is an energy source, roughage which is a fiber to help the rumen work properly and then minerals to make sure they are getting all of the nutrients they need.
Pasture to Plate
A safe food product

1,100 to 1,400 pounds depending on breed type

How much of the 1,400 lbs. of a market-ready beef goes to the grocery store?
Pasture to Plate
A safe food product

64%

About 900 pounds of meat. The remaining portions are also used in consumer goods.

Pasture to Plate
A safe food product

Where does Nebraska rank nationally in commercial red meat production?
Females are called heifers until they have their first calf when they become cows.

A cow is pregnant for about 9 months. She usually gives birth to 1 offspring, which is called a calf, but sometimes a cow may have twins. When a cow gives birth it is called calving.

Cows nurse their calves until they are about 7 or 8 months old. Some heifer calves are kept in the herd to produce the next generation of calves.

Heifers that are not being kept for breeding will be moved to a feedlot until they are market-ready. Steers are also kept in a feedlot until they go to market.
A Day in the Life...

February and April.
70-80 pounds.

Once they are born

- Ear tag
- Branding
In the Spring...

- pasture grass
- learn to eat grass
- Creep feed
- Fresh water

Ruminant Anatomy and Physiology

ruminant?
ruminants?
digest their food?

[Diagram of ruminant stomach]
In the Fall...

500 – 600 pounds

- Weaned

feedlot

Life in the Feedlot

1–3 times per day

- Corn (energy)
- Roughage (fiber)
- Mineral Supplements
Life in the Feedlot

Average 3 lbs. of gain per day

Animal Handling
Beef contains some very important nutrients

- Do you know what key nutrients beef can provide in our diet?
- Let’s take a look at each of these nutrients and why they are important.
You’ve seen how ZIP

Let’s take a look at more nutrients found in beef and how they relate to diet.

B-vitamins help release energy in food. Beef is one of the best sources of B-vitamins in our diet.

Vitamin B₃:

Vitamin B₉:

Vitamin B₁₂:
What comes from BEEF CATTLE?

1,000 Pound Steer

432 Pounds Meat (Beef)
568 Pounds By-products

MEAT (BEEF)
- Steaks
- Roast
- Ribs
- Brisket
- Hamburger

BONES, HORNES & HOOVES
- Glue
- Marshmallows
- Toothbrushes
- Piano Keys
- Wallpaper
- Violin String
- Sandpaper
- Bone China
- Combs
- Buttons

HIDE & HAIR
- Candles
- Shampoo
- Toothpastes
- Pill Capsules
- Band-Aids
- Deodorant
- Vitamins
- Jell-O
- Soap
- Film

INEDIBLE FATTY ACID & GELATIN
- Sports Equipment
- Paint Brushes
- Shoes & Boots
- Luggage
- Gloves
- Belts
Section I: Program Information

1. Please provide the following information about the Ag Literacy Festival you attended:
   Date of Festival: ___________________________________________
   Location of Festival: _______________________________________

2. Please provide the following information about your participation:
   Name of School: ___________________________________________
   Teacher Name: ____________________________________________
   E-Mail Address: ___________________________________________
   Total # of Students: _________
   Gender: Total # Males: ____________  Total # Females: __________
   Total # in each Grade: K:______  1st:______  2nd:______  3rd:______  4th:______  5th:______
   Total # in each Ethnicity: Hispanic or Latino:_______  Not Hispanic or Latino: _________
   Total # in each Race: American Indian or Alaskan Native: ______
   Asian: ______
   Black or African American: ______
   Native Hawaiian or Other Pacific Islander: ______
   White: ______

3. How many years have you been bringing students to this Ag Literacy Festival?
   Total # of years: ____________________
Section II: Program Satisfaction

4. Please indicate how satisfied you are with the following statements. (Select one response in each row by marking the appropriate box ☒.)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Very Dissatisfied</th>
<th>Dissatisfied</th>
<th>Neutral</th>
<th>Satisfied</th>
<th>Very Satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of educational content</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Presentation was age-appropriate</td>
<td>☐</td>
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<tr>
<td>Presentation was engaging</td>
<td>☐</td>
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<tr>
<td>Presentation was relevant to classroom content</td>
<td>☐</td>
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<td>☐</td>
</tr>
</tbody>
</table>

5. Please answer the following questions by writing your answer in the space provided or by marking the appropriate box ☒.

5. Which session best complements what you teach in the classroom? Please explain.

6. In your opinion, what was the one thing students were most excited about learning?

7. Given the opportunity, would you participate in the program again? (Mark one box ☒)
   ☐ Yes
   ☐ No

8. Please explain why you would or would not participate in the program again.
9. Based on your observation, please indicate how much you agree or disagree with the following statements. (Select one response in each row by marking the appropriate box ☒.)

| Youth are able to explain the progression of agriculture technology and how it affects corn and soybean production. | Strongly Disagree 1 | Moderately Agree 3 | Strongly Agree 5 |
| Youth are able to identify the importance of technology in agriculture to help farmers feed the world. | | | |
| Youth are able to determine what products they use in their lives are from corn and soybeans. | | | |
| Youth are able to explain how corn and soybeans are used for different purposes (human/animal/energy). | | | |
| Youth are able to recognize the corn and soybean production cycles. | | | |
| Youth are able to identify the science behind the Plant Life Cycle. | | | |
| Youth are able to apply math utilizing corn and soybean production statistics. | | | |
| Youth can summarize the beef production cycle. | | | |
| Youth can recognize beef products and by-products. | | | |
| Youth can describe how pig farmers care for their pigs. | | | |
| Youth can express how pig farmers care for the environment. | | | |
| Youth can identify dairy products. | | | |
| Youth can tell others about the milk production cycle and how dairy farmers care for their dairy animals. | | | |

Please answer the following questions by writing your answer in the space provided.

10. As a result of participating in this program, what did your students learn?
11. As a result of participating in this program, how do you think your students will apply what they learned to their everyday lives?

12. Please make any suggestions and/or comments.