

# Getting Started with the Animal Agriculture Beef Demonstration Project

How to use the Demo Projects-

Each demo project has been selected to help users see how COMET-Farm works and how to navigate the data entry pages in a completed project. While navigating through a Demo Project, there are help windows providing information on the site or the management practices that have been selected.

## What information will I need?

- Location is provided by the zip code.
- Animal type, herd size, and age classes (e.g. calves, replacement females, mature females, mature males, etc.).
- Feed types and rations
- Method for manure management

## Walkthrough of the animal agriculture demonstration project

- 1. Description of the Demonstration Project:** One of the primary sources of greenhouse gas emissions from animal production systems comes from methane produced in the guts of ruminants through enteric fermentation. Livestock such as cattle, goats, sheep, deer and American Bison are ruminants and emit higher levels of methane (CH<sub>4</sub>) emissions compared to hindgut fermenters such as horses. In beef production systems, enteric methane tends to be the largest source of emissions. To reduce the amount of enteric emissions that ruminates emit, producers can manage the diets of these animals. Management practices that target the bacterial population in the rumen to increase animal performance and efficiencies can reduce enteric emissions. Another management practices that can have an impact on enteric emissions is the quality of feed and the amount of time it takes an animal to reach a target weight. This demo project focuses the impact on enteric emissions from two different feed rations for Beef-Steer stockers.
- 2. Activities**
  - a. Once the demo project has been selected, click on “Define Activities” to continue to Property Location.
- 3. Property Location**
  - a. The **Property location** for the demo project is located at Utah State University’s Animal Science Farm. The Farm is located south of the main campus located in Logan, Utah.

- b. The property location zip code (84339) has already been entered.
- c. The units of measure have been preselected from the dropdown menu. For the purpose of the demo, the preferred units of measure are English. To continue to **Animal Types** click on the “Save & Continue” button just below the Property Location text box.

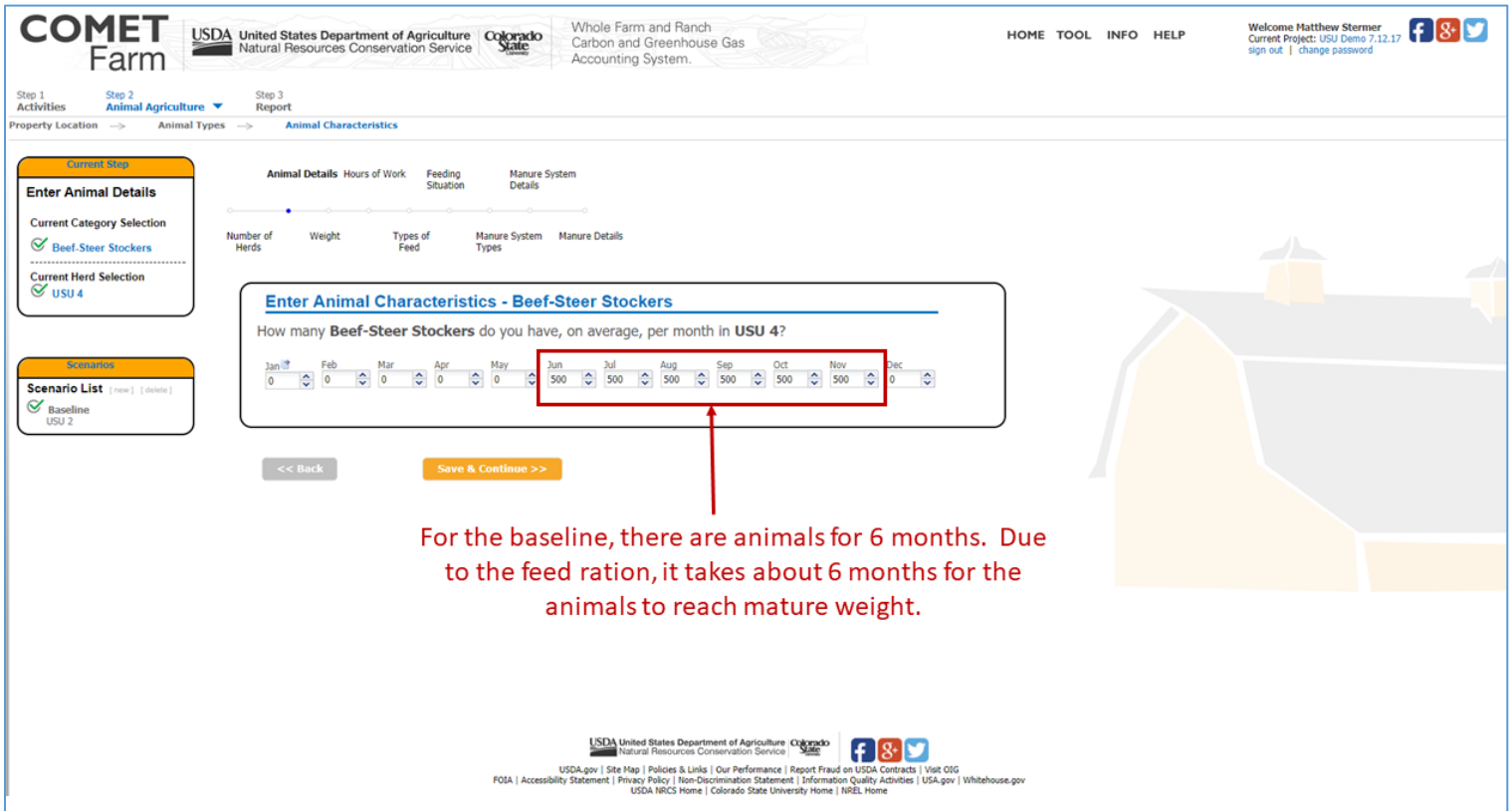
**4. Animal Type**

- a. A help window will appear when the animal types page is opened, after reading the animal type description click the “ok” button in the bottom right corner of the window.
- b. There are many different animal type options available. For the purpose of the demo Beef-Steer Stockers are the only animal type selected. To continue to **Animal Characteristics** click on the “Save & Continue” button located below the animal types table.

**5. Animal Characteristics**

- a. The demo project details are explained in the “Demo- Current Management” window that appears when the Animal Characteristics page opens. After reading the current management description, click the “ok” button in the bottom right corner of the window. The management system reflects the selected options for the Animal Characteristics for the Beef-Steer Stockers throughout the demo project.

- b. Seven different Animal Characteristics categories are outlined in the roadmap found in the upper middle portion of the window. This roadmap indicates the Animal Characteristic information that is being selected. The “Number of Herds” is the first Animal Characteristic that will appear.



1. On the **Number of Herds** page, users can select how many unique herds in their enterprise for each animal category. In the box to the right of “How many unique herds do you have?” click on the “1” and type in your value or use the up and down arrows to select the correct number. For the purpose of the demo, do not change the number of unique herds.
  - a. When the number of all the unique herds has been entered, you will be able to label each herd with a descriptive name. To assign a label for each herd, locate the box (es) under “Assign unique label to each of your herds” found inside of the “Enter Animal Characteristics” window. The first herd will be labeled “USU 4” when the demo project is in use. The default naming convention for herds will be “Default Herd”. To change the name of the herd click on the default label inside of the text box, then type the desired name.
  - b. When all the unique herds have been labeled click on the “Save & Continue” button located at the bottom of the page to navigate to the **Animal Details** page.
2. Users will enter the number of cattle they have based on the average number in the herd month.
  - a. Animal numbers are added by clicking in the box located under each month starting with January. Values can be entered by typing the value in or using the up and down arrows found to the right of each box.

- b. If animal populations are the same throughout the year, users can click on the icon to the right of “Jan” that looks like a page with an arrow on it. Clicking the icon will populate the value that is in the “Jan” box into all the other months. This feature is designed to save time in data entry.
  - c. When entering population details for Beef-Steer Stockers, there will only be animal populations for six months under the baseline scenario. Starting in June and ending in November, there will be 500 animals on average.
  - d. When all values have been entered click on “Save & Continue” to navigate onto the **Weight page**.
3. The **Weight Page** you will need to enter the “Average Beef-Steer Stockers body weight”, “Average daily weight gain” and “Average mature weight”. These values are based on the average weight of the herd.
    - a. For the demo project, we have entered 850 for the Average Beef-Steer Stockers body weight, Average Daily weight gain is 2 lbs., and the Average mature weight was 1250.
    - b. When all values have been entered, click on “Save & Continue” to navigate onto the “Hours of Work” page.
  4. The **Hours of Work** page needs to be completed. If the animals are used as draft animals, enter the average hours that the animals do work each day in the box.
    - a. If the animals are not used as draft animals, leave the “0” in the box and click on “Save & Continue” to move onto “**Types of Feed**” page.
  5. The **Types of Feed** page allows users to create feed rations to reflect the varying diets that can occur for cattle during different stages of production. The feed types that are used in this demo project were based on feed rations taken from the Factsheet *Grain Finishing Beef: Alternative Rations, Cattle Performance and Feeding Costs for Small Feeders* from Utah State University. The feed types have already been added for this unique herd. Users will see that in the right column of the date range table there is a header labeled “Complete” and “Yes” is in all the columns to the right of each month. This indicates that the feed type has been completed for that month.
    - a. The feed types table has been set up in sections indicated by three steps.
      - i. In the first step, select the months that the same feed types are fed to the unique herd in the “Date Range” table. To select the months, user can click on the box to the left of the month that they wish to select. If animals are fed the same feed types for all the months an animal population exists, clicking on the box to the left of “Month” at the top of the Date range table will select all of the months.
      - ii. The second step found in the Feed Types table is selecting the feed stuffs for the unique herd. There are three boxes and each is labeled.
        - a) The first box labeled “Feed Stuff”. In the search box located at the top of the window, users may enter the feed stuff to locate the particular feed type and avoid having to scroll through the list. There is also a scroll bar on the right of the box that can be used to visually search the list of feed stuffs.
        - b) The second box is labeled “Category”, this box will be empty until a feed stuff has been selected from the Feed Stuff box. The options that appear are related to the type of feed stuff and how it is processed or available as a feed.

- c) The third box labeled “Your Selections”. This box is separated from the category box by the “Add” button and the “Remove” button. This box has the selected feed stuff for this demo project. The selections naming convention has the feed stuff on the top and the category below it (e.g. Grass-Hay or Corn- Silage, Mature Well Eared). The “Grass” is the feed stuff, and “Hay” is the category. To the right of the box is the “Confirm Selections” button. When this button is clicked, all the Feed Stuff/Category combinations will appear under the three boxes. This must be completed in order to move on to the third step.

**Enter Animal Characteristics - Beef-Steer Stockers**

1. Select a range of months for your **Beef-Steer Stockers** in the table below to enter in your feed types. Complete all months before proceeding to next panel.

Month	Completed
Jun	Yes
Jul	Yes
Aug	Yes
Sep	Yes
Oct	Yes
Nov	Yes

Remove all the dates and start over.

Months with animal populations.

2. Choose the types of feed consumed for your **Beef-Steer Stockers** for the month/months in your **USU 4**.

Feed Stuff

Search

- Alfalfa
- Almond
- Ammonium
- Apple
- Artichoke
- Avocado
- Bahagrass
- Bakery
- Bananas
- Barley
- Beans
- Beet
- Bermudagrass
- Birdfoot

Category

Your Selections

- Alfalfa
- Hay Full Bloom
- Corn
- Grain, Whole
- Grass
- Hay

Add >>

<< Remove

Confirm Selections

Feed ration.

3. Enter the percentage of each feed for your **Beef-Steer Stockers** in **USU 4**.

Alfalfa 30

Hay Full Bloom

Corn 40

Grain, Whole

Grass 30

Hay

The feed ration is based on 60% grass hay/alfalfa and 40% corn grain.

Done - Save feed types for current selected date.

<< Back Save & Continue >>

- iii. The third step in the Feed Types table requires you to define the percentage of each feed stuff that make up a ration for the unique herd. To the right of each feed stuff are listed in the table is a box that represents the percentage (by weight) that feed stuff item represents in the animal diet. That number has been selected for this demo from the beef stocker diet circular described earlier in this document. The total of all of the feed stuff amounts must add up to 100%.
    - iv. When all the feed stuffs have been selected and they total 100%, click on the “Done-Save feed types for current selected date” button located below the feed stuff percentages. This has already been done for the purposes of this demo so it does not need to be done for this demonstration project.
  - b. When all months have feed types selected for them and saved, users can click on “Save & Continue” to navigate onto the **Feeding Situation** page.
6. **Feeding Situation** are used to determine energy needs of the animals. The energy needs are used to calculate enteric emissions. Feeding situation is defined for each unique herd.
  - a. Users select the feeding situation by clicking on one of the three options provided in the text box. Based on the location, for this demo the feeding situation is “Stall”.
  - b. When feeding situation has been completed click on the “Save & Continue” button to continue to **Manure System Types** page.
7. **Manure System Types** is associated with how manure is managed at the facility. When defining the manure treatment, be sure to use the end or final treatment/outdoor storage. For this demo, a solid/liquid separator is not used. The final treatment of the manure is “Temporary Stack and Long-Term Storage.”
  - a. Notice that “No” is selected to the right of “Do you use a solid /liquid separator?” Solid-liquid separators are frequently used to separate out manure solids before storage in lagoons at dairies and swine feeding operations.
  - b. For this baseline scenario, manure is temporary stacked in the pen. The stacks are then removed and stored in long-term stockpile. Hence the “Temporary Stack and Long-Term Stockpile” option is selected.
  - c. When all the manure management system options have been completed click on the “Save & Continue” button to continue to the **Manure System Details** page.
8. **Manure Systems Details** page gathers more information on how manure is further managed. The options on this page are generated based on previous options selected on the manure system types page. For this demo manure is managed as a solid.
  - a. Manure is managed as a solid in this demo project, the first question of the Manure Systems Details page refers to “What is the system cover type?” Located to the right of the question is a dropdown menu that has options for composting. For this demo the cover type is “Uncovered Solid”.
  - b. Since the manure is stored, there is a question regarding the storage length. To the right of “Is the manure stored for more or less than six months?”, click on the drop down menu. For the demo project “Long term (more than six months)” is selected.
  - c. When all the manure management system details have been completed click on the “Save & Continue” button to continue to the **Manure Details** page.

9. **Manure Details** has two sections in the table.
  - a. The top section, labeled “What is the total dry manure produced per head per day?” appears when the page is opened.
  - b. The bottom section, labeled “What is the average percent nitrogen content of the manure each month?” also appears when the page is opened.
    - i. These values have been calculated based on information that has been entered in the previous modules. There is no need to change the values unless a user has actual measurements from their enterprise.
    - ii. Nitrogen content may be found in laboratory reports of manure waste from your enterprise. These fields have been pre-populated with average values and may be left as they are if the nitrogen content of the manure is unknown.
  - c. When all the manure management details have been completed click on the “Save & Continue” button to continue to the **Scenario Complete** window.
10. After the baseline scenario has been completed, the “Scenario Complete!” window will appear. For the purpose of the demo click the “Close” button. This will return the user to the manure details page. To continue onto the future scenario, click on “USU 2” found on the left side of the page in the “Scenarios” box.

The screenshot shows the 'Enter Animal Characteristics - Beef-Steer Stockers' page. On the left sidebar, the 'Scenarios' section lists 'Baseline' and 'USU 2'. A 'Scenario Complete!' dialog box is open, with a red arrow pointing to the 'Close' button. A red text annotation on the right says 'Return to current scenario to view information or select a different scenario'. The main content area contains a table for manure details and a section for average percent nitrogen content.

- a. **Scenario Management** is explained in the “Demo- Scenario Management” window that appears when the USU 2 Animal Characteristics page is opened. After reading the future management description, click the “ok” button in the bottom right corner of the window. This aspect of COMET-Farm allows users to see how changes in management practices can impact greenhouse gas emissions and carbon sequestration.
- b. The animal types, unique herds and management practices defined in the users “Current Management” are automatically used as the baseline to which all future management scenarios are compared. Additionally, the user can automatically copy the management from the Current Management (or any future management scenario) to a new future management scenario, to use as the basis for a management change (such as changing only certain feed stuffs, or changing manure management.). Any of the management practices that have been defined in current management can be changed in the future scenario. For the Animal Agriculture Beef Steer Stockers Demo there is one future management scenario, using the same animal types, unique herds and management practices. The management practice that is changed is the in the feed ration, which as a result in a higher average daily weight leading to a shorter time needed to reach mature weight. The higher daily weight gains shorten the numbers of months animals are on feed from 6 months to 4 months.

The screenshot shows the 'Enter Animal Characteristics - Beef-Steer Stockers' form. The form asks: 'How many Beef-Steer Stockers do you have, on average, per month in USU 4?'. Below this is a table with columns for months from Jan to Dec. The values are: Jan (0), Feb (0), Mar (0), Apr (0), May (0), Jun (500), Jul (500), Aug (500), Sep (500), Oct (0), Nov (0), Dec (0). A red box highlights the Jun, Jul, Aug, and Sep columns. Below the table are '<< Back' and 'Save & Continue >>' buttons. A red arrow points from the 'Save & Continue' button to a red text box below the screenshot.

For the baseline, there are animals for 6 months. With a change in the feed ration, it takes about 4 months for the animals to reach a target mature weight.



- c. Changes in the feed ration have affected management practices input for Animal Details, Weight and Types of Feed.
  - i. The first management input that was changed from the baseline is the animal details page. Click on the “Animal Details” to see there are animal populations for four months starting in June.

The screenshot shows the 'COMET Farm' web application interface. At the top, there are logos for USDA, Colorado State University, and the Whole Farm and Ranch Carbon and Greenhouse Gas Accounting System. The user is logged in as Matthew Stermer. The navigation bar shows 'Step 1 Activities', 'Step 2 Animal Agriculture', and 'Step 3 Report'. The current step is 'Animal Characteristics', which is divided into 'Animal Details', 'Hours of Work', 'Feeding Situation', and 'Manure System Details'. The 'Animal Details' sub-step is active, showing 'Current Category Selection' as 'Beef-Steer Stockers' and 'Current Herd Selection' as 'USU 4'. A 'Scenario List' on the left shows 'Baseline' as 'USU 2'. The main form area is titled 'Enter Animal Characteristics - Beef-Steer Stockers' and asks for weight characteristics for herd 'USU 4'. It includes three input fields: 'Average Beef-Steer Stockers body weight (lbs)' set to 850, 'Average daily weight gain (lbs)' set to 3.25 (highlighted with a red box and arrow), and 'Average mature weight (lbs)' set to 1250. A red annotation points to the 3.25 value, stating 'Average daily weight gain increased from 2 to 3.25 lbs.'. Navigation buttons for '<< Back' and 'Save & Continue >>' are at the bottom of the form.

- ii. The second management input of “Weight” was also changed. The average daily weight gain increased from 2 lbs. to 3.25 lbs. To see the change click on the “Weight” tab in the Animal Characteristics roadmap.

- iii. To see the change in the feed ration click on the “Types of Feed” in the roadmap at the top of the page. The feed ration changed from the 60% grass hay /alfalfa, 40% corn grain to 70% corn grain, steam flaked and 30% alfalfa/ grass hay.

**Enter Animal Characteristics - Beef-Steer Stockers**

1. Select a range of months for your **Beef-Steer Stockers** in the table below to enter in your feed types. Complete all months before proceeding to next panel. ⓘ

Date Range	Month	Completed
<input type="checkbox"/>	Month	
<input checked="" type="checkbox"/>	Jun	Yes
<input checked="" type="checkbox"/>	Jul	Yes
<input checked="" type="checkbox"/>	Aug	Yes
<input checked="" type="checkbox"/>	Sep	Yes

Remove all the dates and start over.

Months with animal populations.

2. Choose the types of feed consumed for your **Beef-Steer Stockers** for the month/months in your **USU 4**.

**Feed Stuff** ⓘ

Search

- Alfalfa
- Almond
- Ammonium
- Apple
- Artichoke
- Avocado
- Bahagrass
- Bakery
- Bananas
- Barley
- Beans
- Beet
- Bermudagrass
- Birdfoot

**Category** ⓘ

**Your Selections** ⓘ

- Alfalfa
- Hay Full Bloom
- Corn Grain, Steam Flaked
- Grass Hay

Confirm Selections

Feed ration.

3. Enter the percentage of each feed for your **Beef-Steer Stockers** in **USU 4**. ⓘ

Alfalfa	15
Hay Full Bloom	
Corn Grain, Steam Flaked	70
Grass Hay	15

Done - Save feed types for current selected date.

The feed ration is based on 30% grass hay/alfalfa and 70% corn grain, steam flaked.

<< Back      Save & Continue >>

- d. When all the manure management system details have been completed click on the “Save & Continue” button to continue to the **Manure Details** page.

11. Manure Management Details were not changed in the demo project. Click on the “Save & Continue” button to continue to the **Future Scenario** window.
12. After the USU 2 scenario data entry is completed, the “Scenario Complete!” window will appear. For the purpose of the Demo project click on “Continue to Report” to see results/reports.

13. The time to generate a report for the demo project is typically less than 1 minute. However, for the user’s projects, depending on the number of scenarios and the complexity of the projects it may take several minutes to load the results. The user may navigate his or her browser away from the page as the information entered has been saved. The reports will be available to registered users when they return later to the tool and open the project, by clicking on the “Report” option in the navigation bar at the top of the page. Non-registered users can access the reports of demo projects but any changes to the projects will not be saved for future review and analysis.

14. Reports

- a. The demo report presents information listing the source categories in the column on the left. Baseline emissions are listed in the center column of the table. The USU 2 scenario is listed in the right column of the table. The far right column is the change in emissions. The demo project compares the baseline scenario, which focuses on a feed ration of 40% corn grain 60% grass hay/ alfalfa, to the emissions related to a feed ration of 70% corn grain steam flaked and 30% grass hay/alfalfa. Results are presented in a table format and in a graphical report. Both sets of data can be printed.

Step 1 Activities | Step 2 Animal Agriculture | Step 3 Report

Animal Agriculture | Animal Agriculture Graphical Report

NAME: Matthew Stermer | TIME: 7/12/2017 12:42:42 PM | PROJECT: USU Demo 7.12.17

Source	Baseline Emissions	USU 2	
		Emissions	Change
<b>Beef-Steer Stockers</b>			
Methane (tonnes CO <sub>2</sub> equiv./yr.)	317.7	221.0	-96.7
Enteric	303.8	209.8	-93.9
Solid Storage	14.0	11.2	-2.8
Nitrous oxide (tonnes CO <sub>2</sub> equiv./yr.)	14.8	9.8	-4.9
Solid Storage	14.8	9.8	-4.9
<b>Total</b>	<b>332.5</b>	<b>230.9</b>	<b>-101.6</b>
<b>Total (all animals)</b>	<b>332.5</b>	<b>230.9</b>	<b>-101.6</b>

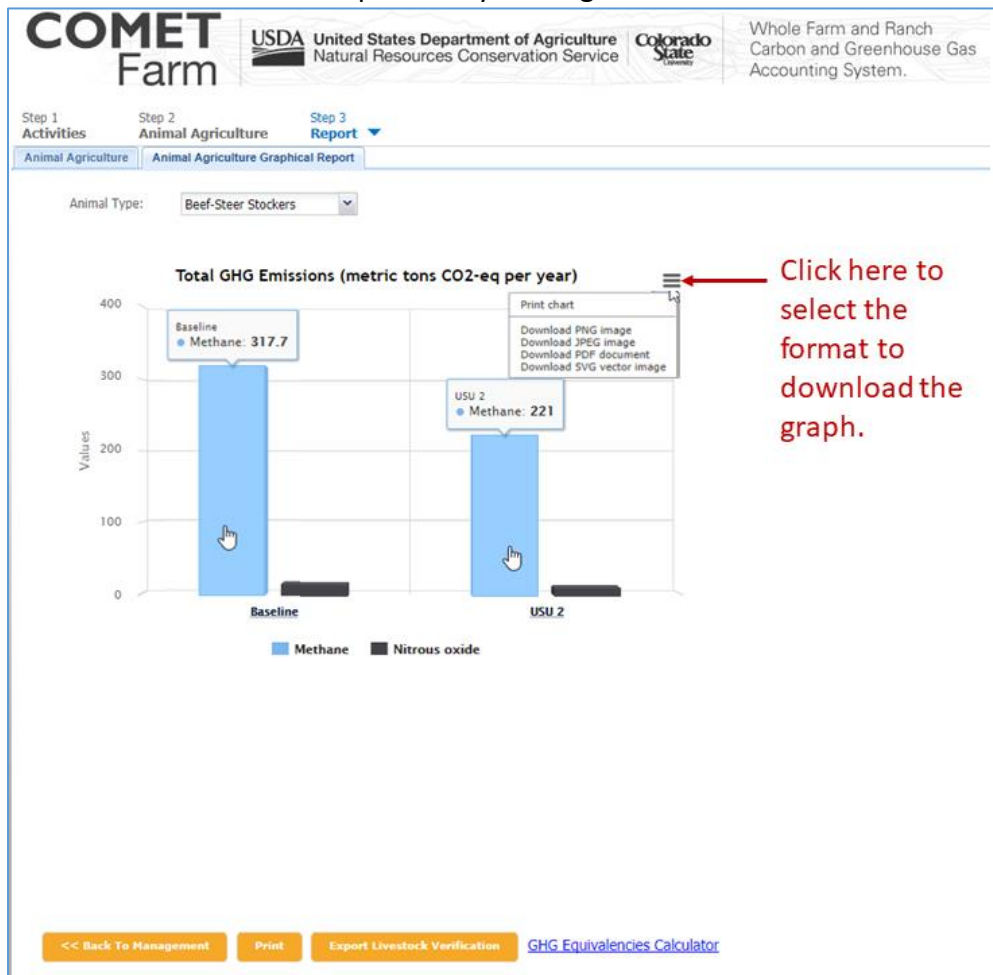
Change in emissions due to change in feed values reducing the feeding period to reach target weight.

Feed ration 60% hay 40% grain

Feed ration 70% grain 30% hay

<< Back To Management | Print | Export Livestock Verification | GHG Equivalencies Calculator

i. Table data can be printed by clicking on the “Print” button below the table.



ii. Graphical data can be downloaded or printed by clicking the dropdown menu to the top right of the graph. Multiple file format options are provided.

❖ **Features found on the Activities page**

- The ? icons provide information on the categories and what can be evaluated.
- At any time throughout the Demo, clicking on any of the buttons located in the top right of the window will take users directly to that page.

❖ **Helpful tips**

- There are definitions of common questions on the right that provide users with information on selecting the activity that will best resemble their unique operation.
- Utah State University Fact sheet  
[http://extension.usu.edu/files/publications/publication/AG\\_AppliedEconomics\\_2014-01pr.pdf](http://extension.usu.edu/files/publications/publication/AG_AppliedEconomics_2014-01pr.pdf)