



ANIMAL SCIENCE

# STEAK SCIENCE

UNIVERSITY OF NEBRASKA

YOUTH MEAT SCIENCE CURRICULUM  
COPYRIGHT UNIVERSITY OF  
NEBRASKA-LINCOLN 2021



# EXTENSION How Much Meat do Animals Provide?

**Quick overview:** In this lesson, students will learn about how much meat an animal can provide and about how meat goes from being a part of a carcass to a salable product by having the hands-on experience of “fabricating” a piece of watermelon.

## Materials Needed:

- Seeded Watermelon, cut into slices
- Cutting board
- Knife
- Disposable plates
- Plastic knives or spoons
- Paper towels
- Kitchen Scale

## PRIOR TO:

**Delivery type:** Hands-On/Demonstration

**Prep Work:** Purchase and weigh a **seeded** watermelon. Cut into  $\geq 1$  in. thick slices (one slice per student).

## Directions:

- Introduce the lesson and provide students a background of meat production and yield. Familiarize the students with the terms carcass, meat, fat, bone, yield, and fabricate in relation to meat science.
- Give every student in the class a slice of watermelon on a plate and a plastic knife.
- For this lesson, the whole watermelon will represent a beef carcass, the fruit will represent meat, the seeds will represent bone, and the rind will represent fat.
- Have the students first remove the seeds, trying to leave the watermelon in as large of pieces as possible. Some seeds will be able to be plucked out easily. Others may require students to make a cut. Remind the students that the watermelon is “meat” and needs to stay in large portions to be able to cut “steaks” and “roasts” from. Set seeds aside (“bones”).
- Once the seeds are removed, have the students cut off the rind. Set rind aside (“fat”).
- Once the student is left with just the fruit, they can cut it into pieces (“steaks, roasts, trim for ground beef”).
- The students should be left with 3 piles, cut up fruit (“meat”), seeds (“bone”) and rind (“fat”). Explain that when meat is cut, the same thing occurs. The bone and excess fat are removed and the whole muscle section is cut into steaks and roasts.
- Have the students each weigh their “meat”, “bone” and “fat” and calculate the total amount of each.
- From here, you can determine the yield, or how much boneless, closely trimmed, retail cuts, came from the watermelon ((weight of “meat”  $\div$  Weight of “carcass”) x 100) = Percent Yield.

**Discussion Point:** What are some of your favorite cuts of beef? Do you know where those cuts come from on the animal?

Visit: <https://www.beefitswhatsfordinner.com/cuts/cut-charts> to view beef cut charts.



# EXTENSION How Much Meat do Animals Provide?

## The Science:

One important measurement of a market animal is how much it will yield. Yield answers the question of “how much?” How much meat can we expect from the animal? How many pounds of boneless, closely trimmed, retail cuts will make it to the grocery store? Meat is divided into retail cuts through a series of steps described below.

**Step 1: The Animal is harvest.** (Optional talking point based on the age of your audience.)

Harvest is a term often used instead of slaughter. When an animal is harvested, the head, hide, hooves, blood and viscera (internal organs) are removed. What is left is referred to as the “hot carcass.” The carcass is composed of muscle (meat), bone, fat and connective tissue. For this lesson, we will use the watermelon to represent the carcass, the fruit will represent meat, the seeds will represent bone and the rind will represent fat.

**Step 2: Fabricate the carcass into primals and subprimals.**

Fabricate is another word for cut and primals and subprimals refer to large groupings of muscles. The carcass is first fabricated into large muscle sections and then further divided into the common cuts that you would see at the grocery store. During this process, excess fat is trimmed and bones can begin to be removed. Similarly, when a watermelon is cut, it is not immediately divided into bite size pieces. It is first cut into large chunks and then further divided.

If you are comfortable, start with a whole watermelon. Cut it into chunks in front of the students to give them a better understanding of primals and subprimals.

**Step 3: Cut the subprimals into retail cuts.**

At this point, the muscle groups can be further portioned into steaks and roasts that will be sold at the retail counter. Remaining bones are removed (unless cutting bone-in steaks and roasts, then some bones remain) and excess fat is trimmed off. Once this step is completed, you are left with the yield from that animal, or the boneless, closely trimmed, retail cuts. In a watermelon, we are left with bite sized pieces of fruit. Yield for a market animal would consist of steaks, roasts, chops, etc. Yield is best described as the actual amount of edible product obtained from a carcass. In order to calculate yield, the weight of the edible product is divided by the carcass weight and multiplied by 100. This leaves us with the percent of the carcass that is made up of edible product.

**Dressing Percent:** Percent of the weight of the live animal that is transferred to the carcass.

$(880 \text{ lb. carcass} \div 1,400 \text{ lb. live steer}) = 62.8\% \text{ Dressing Percent.}$

**Yield:** Percent of boneless, closely trimmed retail cuts.

$(550 \text{ lbs. of beef} \div 880 \text{ lb. carcass weight}) \times 100 = 62.5\% \text{ Yield.}$



UNIVERSITY OF NEBRASKA-LINCOLN

Youth Meat Science Curriculum

## EXTENSION How Much Meat do Animals Provide?

### The Science Continued:

The amount of yield that you can get from a beef animal can vary by how much muscle they have, how much fat needs to be trimmed off, the breed and genetic background of the animal, and the sex of the animal. Additionally, if there are any bruises on the carcass, they are trimmed off and can lessen the amount of available product. This is important to remember when handling live animals.

During the harvest and fabrication process, a lot of weight is seemingly “lost.” If you were to bring a 1,400 lb. steer to the butcher, it is likely that you will only get about 550 lbs. of meat back. The weight that is “lost” is in the bones, fat, hide, blood, etc. However, none of this weight is actually lost; it can all be used in other industries and is referred to as “byproducts”. Some of these products you use everyday, including leather car seats and baseballs (hide), marshmallows and buttons (bone), soap and deodorant (fat) and much more!

### 4-H ADAPTATION

**Presentations/Poster:** Students could prepare an oral presentation or poster about the topic promoting agricultural literacy.

### LEARNING OUTCOMES

Students will make connections between market animals and the meat they provide through hands on learning and use of mathematical reasoning.

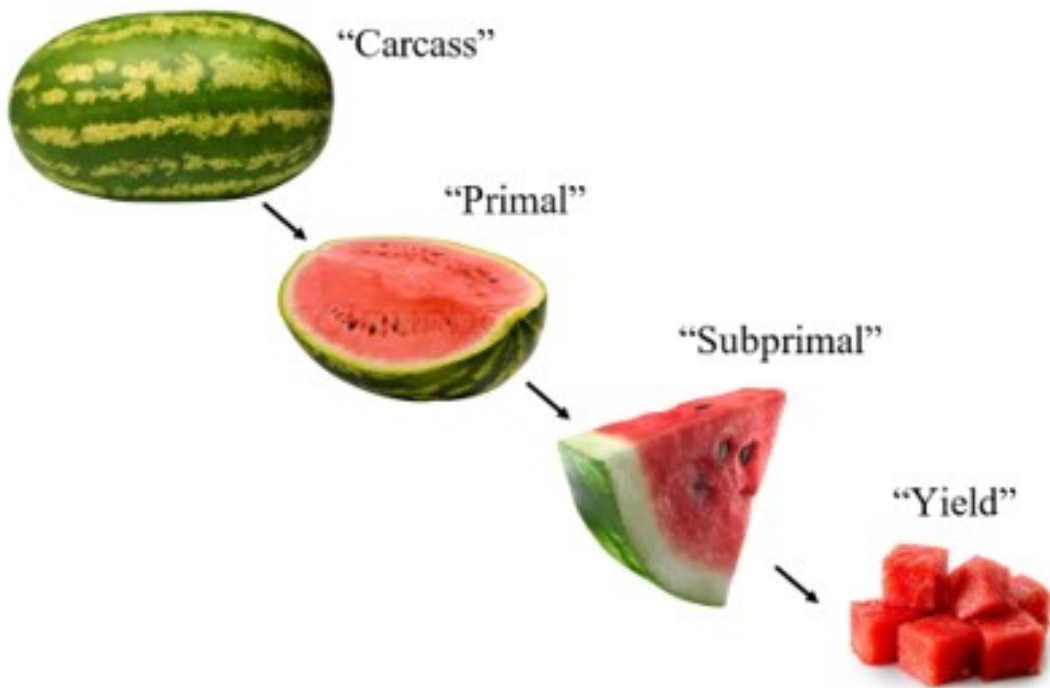
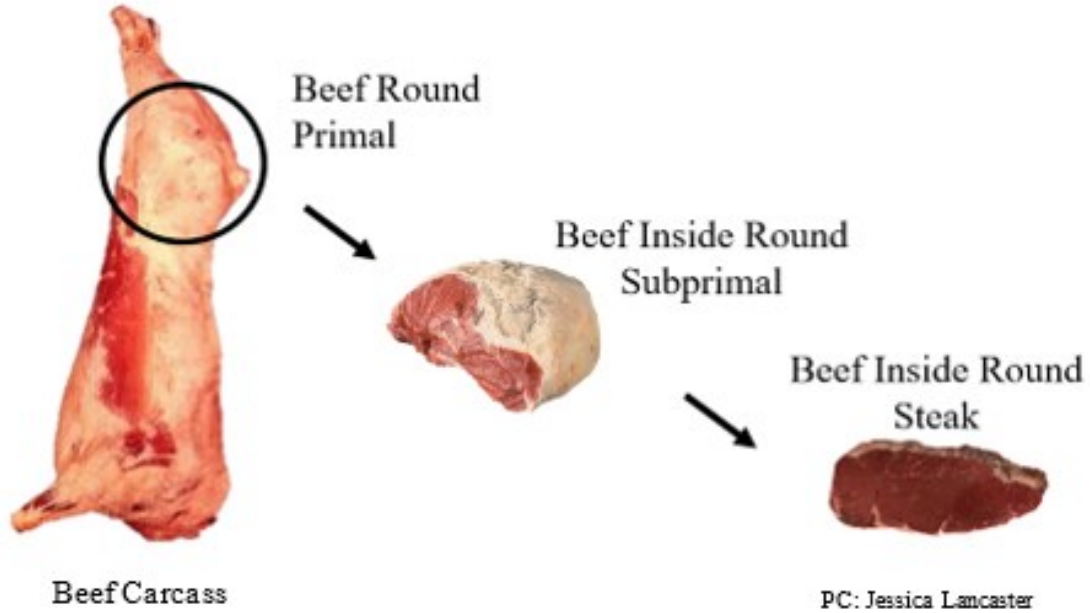
### ADDITIONAL INFORMATION

Depending on the age of the children you are working with and the rules set forth by the school or organization you are with, you may need to use plastic spoons rather than knives for this project. This should work fine to remove the seeds and “cut” up the watermelon. Additional assistance may need to be provided when removing the rind.

If time allows, this lesson can incorporate more information about byproducts. Additional information can be found in the “Everything but the Moo” lesson.



# EXTENSION How Much Meat do Animals Provide?



**ANIMAL SCIENCE**

**Contact:**

Brianna Buseman  
Youth Meat Extension Educator  
Brianna.buseman@unl.edu