



Slice Shear Force/Cooked Color/ Warner-Bratzler Shear Force – 1 steak only

Kitchen Set-Up – Always start by filling out log sheet

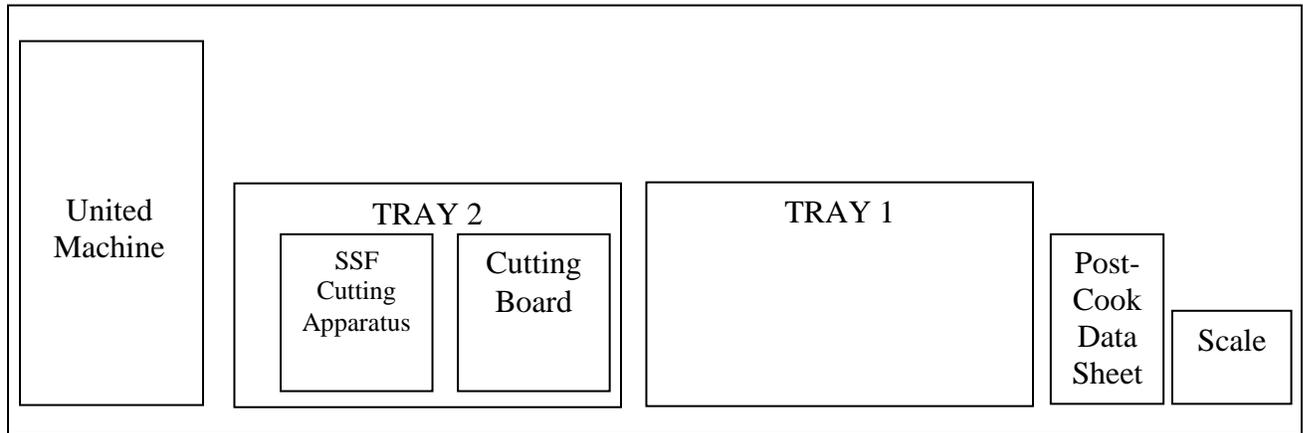
- Turn on belt grill 30 minutes before cooking (See protocol for setup – typically use program F for 1” steaks)
 - Line bottom with foil to ease with clean up
 - Make sure you turn on hood
- See protocol for computer and United machine set-up
- Pre-cook area:
 - If several people are working in the kitchen, get aprons from the meat lab instead of the kitchen
 - Tray to prep steaks
 - *Never get more than one bag of steaks out at a time.*
 - *DO NOT place steaks on grill if temperature is not from 2-5°C.*
 - Cutting board on tray in case steaks need trimmed
 - Knife to cut open bag/trim steaks if needed
 - Scale
 - Calibrated Thermometer
 - Data sheet for pre-cook temperature and weight
 - Writing utensil (pen) for data sheet
 - Towels to wipe hands and keep sheet clean
- Post-cook area:
 - Tray (1) to place steaks for final temperature
 - Scale
 - Find the smallest tray to place on scale to keep the area clean – there should be a small red plastic tray (~ 8 × 11) that works well. Larger trays make it harder to view the weight on the screen.
 - Calibrated Thermometer
 - Place the thermometer in a container on the tray or keep off the tray to keep dry
 - Data sheet for post-cook temperature and weight
 - Writing utensil (pen) for data sheet
 - Towels to wipe hands and keep sheet clean
 - 2 sets tongs to transfer steaks from grill to tray and from tray to scale
 - Tray (2)
 - Place a small cutting board on 1 side – to cut off the lateral end
 - Place the slice shear apparatus on the other
 - Knife to cut lateral end
 - Dual-blade slice shear knife
 - Enough empty trays for cooked steaks
 - Plastic wrap to cover trays
 - Rack to place trays after cooking – *you can't use the one in the cooler if cooking on consecutive days*



- Tags to write time/ID
- Spare ID tags in case tags are illegible when coming off the grill
- Sharpie to write on tags

Suggested set up:

A.



B.

Magi-Grill Operation Instructions

1. Turn the main power switch “ON”.
2. Turn the key switch to the menu position (horizontal) – Display should read [MENU?A].
3. Press the letter of the desired menu (F is the most common for cooking 1” cuts to a medium degree of doneness).
4. Press ENTER to choose the desired menu.
5. Press and hold the LIFT ENABLE button until the belts are fully lowered – **BE SURE TO HOLD THE BUTTON DOWN UNTIL THE DISPLAY CHANGES FROM [SET Ht] to [TIME 15:00] --- If the grill height does not change, the emergency knob may be engaged. Simply pull the knob out to undo the emergency hold.**
6. The grill will begin pre-heating for 15 minutes.



United set-up

1. Turn computer on and United on

Username: Keladams

Password: cows9640

2. Attach blade to United if not already done. The blade must line up with the plate but cannot touch the sides.

3. Use the knobs on the side of the plates to tighten the plates.

4. Lubricate plates/blade with a water bottle.

5. Open program (Dinosaur symbol).

6. Using the F functions and letters at the bottom of the screen, the settings need to be as follows:

a. F1= compression (off)

b. F2= auto=return

c. F3= force units (kg)

d. F4=linear units (mm)

e. F5=area comp (off)

f. F6=cycling = N=1 H=2; L=85

g. F7= test sp= 500

h. F8=ret sp= 500

i. F9= preload= off

j. F10= setup scales; CAP =226.8

7. Use T to test and Z to zero

a. Continue to adjust machine (water bottle) until drag is less than .05; want drag to be about .03, .04, and .05.

8. Place plastic cup under blade to catch samples.

9. Cover keyboard with plastic wrap.

10. Record maximum drag each shear at load and peak intersection.

11. Make sure to periodically clean blade because drag will increase

a. clean roughly every 20 shears.

Cooking Steaks

1. Thaw steaks in Value Added or Teaching/Research refrigerator in kitchen at 2-5°C. Steaks must be set out the day before as thawing takes 18 to 24hr. Thawing more rapidly at room temperature results in increased purge.



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2. Take the internal temperature of each steak in geometric center of steak and record. Temps should be between 2-5°C. The temperatures cannot be outside this range. ***Don't allow steaks to set out and get warmer than 5°C as this will result in a higher degree of doneness. If steaks are not completely thawed, return package to refrigerator.***

3. Set a clean plate on the scale and zero the scale in grams.



4. Weigh each steak with its identification tag in grams and record.

5. Place each steak on the belt grill with its tag near it to maintain identification.



6. Using a new plate, again zero the scale in grams.

7. When steaks are finished cooking, retrieve steaks from grill, weigh the steak with its tag and record.



8. Take the internal temperature of each steak in the geometric center and record. Temps should be 68- 71°C.

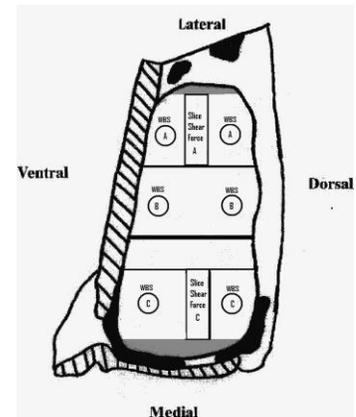


9. When steak reaches final temp, record ID (number and aging period) on tag along with time. Send steak with original and new tag to be cut.

Cutting Steaks

1. Identify lateral end on strips (opposite end of multifidous muscle).

2. Square up muscle.



3. Cut last 5 cm off lateral end (Ignore top hash marks).



4. Identify direction of muscle fibers.

5. Place in box parallel to fibers; want to cut with fibers.

6. Use sawing motion to cut.





7. Keep slice with original tag. Take shear slice from in-between knife blades over and shear, placing flat. (T = test, Z = 0).



8. Collect remaining pieces (2 pieces outside the blade + intact portion) and place on Styrofoam plate with ID tag identifying the time. Place plastic wrap over the cut surface of the intact portion to prevent drying.



9. When done alt + q =exit program.

Cooked Color Evaluation

1. At 10 min post-cooking (10 min after time on tag), remove plastic wrap for cooked color evaluation. A minimum of 3 panelists will evaluate the cut surface of the intact portion using the following scale which corresponds to the **Beef Steak Color Guide** (next page):

Internal Cooked Color

- 7 = Brown
- 6 = Gray brown (Very Well Done)
- 5 = Pinkish-grey (Well Done)
- 4 = Slightly pink (Medium)
- 3 = Pink (Medium Rare)
- 2 = Medium red (Rare)
- 1 = Very red (Very Rare)



BEEF STEAK COLOR GUIDE

Degrees of Doneness



VERY RARE
Approx. 130°F, 55°C



RARE
Approx. 140°F, 60°C



MEDIUM RARE
Approx. 145°F, 63°C



MEDIUM
Approx. 160°F, 71°C



WELL DONE
Approx. 170°F, 77°C



VERY WELL DONE
Approx. 180°F, 82°C



The Official Guide published by the American Meat Science Association in cooperation with the National Live Stock and Meat Board and the U.S. Department of Agriculture/ARS.



2. After panelists have evaluated the steak and scores are recorded, instrumental color is measured. Three independent scans are taken of the cut surface and the average (calculated by Minolta) L*, a*, and b* values are recorded.



3. Place all 3 pieces with tag on tray for overnight chilling. Cover entire tray with plastic wrap when tray is full. Place trays in cooler.



Warner-Bratzler Shearing Steaks

1. Set up Warner Bratzler Shear machine.
2. Take 6 cores from each steak parallel to the longitudinal orientation of the muscle fibers. Check each core to make sure they are devoid of connective tissue or fat.
3. Record degree of doneness. Use the NBCA color chart.
4. Shear each of the six cores and record values. Be sure to re-set shear machine to zero before each core is sheared. Clean shear knife between each sample.
5. Dispose of all meat once all shear values have been recorded in double bagged trash bags.
6. Clean shear machine by dis-assembling, washing, and re-assembling. Place machine back in cupboard for storage after use.
7. After entering data, check each point for accuracy.
8. Make copies of data and store in a properly labeled binder in the lab.



After Cooking Clean-Up

After each cooking session the belt grill should be cleaned to prevent grease build up and aid in maintaining sanitary conditions.

1. After all steaks have been cooked, push the [CANCEL] button and the grill will count down for one cooking cycle.
2. Turn the power switch “OFF”.
3. Remove foil lining grease catching pans and discard.
4. Remove the grease catching pans and clean thoroughly with soap.
5. Wipe down the area below the grease catching pans.
6. Wipe the belts clean with a wet cloth in bleach water (no soap) by turning the belts by hand.
7. **Empty the grease pail from the far left compartment in the trash can and rinse clean.**
8. Dry all pieces of equipment and re-assemble the grill.

Kitchen clean up

- Wipe counters with spray
- Sweep/Mop floor
- Take out all trash
- Keep area cleaner than found

Clean-Up Note: Do not place research towels with kitchen laundry. Take to the meat lab and place immediately in the washer. Start a load of frocks if needed. Retrieve research towels from dryer and return to research towel tub. DO NOT leave research towels lying around the kitchen or collect in a bag over a period of time.