OBJECTIVES

• To show the importance of cooking procedures on meat palatability
• To match each meat cut with the best cooking method
• To present the key procedures needed for successful indoor and outdoor meat cookery
WHAT WE WILL COVER IN THIS UNIT

- Cooking Methods
- Effects of Temperature
- Effects of Doneness
- Meat Marinades and Tenderizers

ASSIGNMENT IN THE MEAT WE EAT

CHAPTER 24

Preparing and Serving Meats
KNOW HOW TO COOK MEAT BY EACH METHOD SHOWN IN Meat Cookery - Three Easy Steps ON PAGES 52 - 54 OF "THE GUIDE TO IDENTIFYING MEAT CUTS"

Very Important!

Know which cooking method to use with all beef, pork and lamb retail cuts.

BEEF STEAK COLOR GUIDE

Degrees of Doneness

STUDY PAGES 54 - 55 OF "THE GUIDE TO IDENTIFYING MEAT CUTS"

Very Rare
130°F. Approx. 55°C

Rare
140°F. Approx. 60°C

Medium Rare
150°F. Approx. 65°C

Medium
160°F. Approx. 70°C

Well Done
170°F. Approx. 75°C

Very Well Done
180°F. Approx. 80°C

KNOW THE INTERNAL TEMPERATURE CORRESPONDING TO EACH DONENESS
IN ADDITION TO FOOD SAFETY --

REASONS FOR COOKING MEAT IN THE HOME:

IMPROVE PALATABILITY
AROMA
FLAVOR
TENDERNESS – POSSIBLY

COOKING METHODS FOR MEAT

**DRY HEAT**
- Roasting
- Broiling
- Grilling
- Pan broiling
- Griddle broiling
- Deep-fat frying
- Stir-frying

**MOIST HEAT**
- Braising
- Cooking in liquid
  - Boiling
  - Simmering
  - Stewing
DRY HEAT

Surround the meat with dry, hot air in an oven, under a broiler, on a grill or over a bed of charcoal or coals.

DRY HEAT DOES NOT TENDERIZE

Dry heat methods are suitable for the more tender cuts of meat such as steaks and chops because dry heat has little tenderizing effect.
DRY HEAT COOKERY METHOD FOR THICK CUTS

ROASTING

1. Heat oven to desired temperature (325° to 350°F for most cuts; 425°F for tenderloin cuts).
2. Place roast (directly from refrigerator), fat side up, on rack in shallow roasting pan. Insert ovenproof meat thermometer so tip is centered in thickest part of roast, not resting in fat or touching bone. Do not add water. Do not cover.
3. Remove roast 5° to 10°F below desired degree of doneness. Transfer roast to carving board; tent loosely with aluminum foil (temperature will continue to rise 5° to 10°F to reach desired doneness and roast will be easier to carve).

STUDY PAGES 52 - 54
LONG TIME, LOW TEMPERATURE COOKERY OF LARGE MEAT CUTS

• If a large meat cut, such as a prime rib or steamship round, is cooked for a long time at a low oven temperature (200°F or lower), muscle tenderization may occur.

• Meat tenderizers cannot be used under such conditions because they have too much time to act.

BEEF ROASTS SLOWLY COOKED COMMERCIALLY IN A WATER BATH

NOTE THE UNIFORMITY OF MUSCLE COLOR
## COOKING METHOD

**BROILING** - FOR THIN TENDER CUTS SUCH AS STEAKS, CHOPS AND CURED PORK

---

### DRY HEAT COOKERY METHOD FOR THIN, TENDER CUTS

<table>
<thead>
<tr>
<th>BROILING</th>
<th>1. Set oven regulator for broiling; preheat for 10 minutes.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Place meat (directly from refrigerator) on rack of broiler pan. Season as desired. Position broiler pan so that surface of meat is within desired distance from the heat source (about 2 to 3 inches for thinner cuts (¼” to 1”); 3 to 4 inches for thicker cuts).</td>
</tr>
<tr>
<td></td>
<td>3. Broil to desired degree of doneness, turning once. After cooking, season with salt, if desired.</td>
</tr>
</tbody>
</table>
TRY BROILING BACON IF YOU HAVEN’T TRIED IT

BROILING AND ROASTING ON A RACK CONSIDERABLY REDUCE FAT CONTENT COMPARED TO FRYING

DRY HEAT COOKERY MEAT FOR THIN, TENDER CUTS

1. Prepare charcoal (because gas grill brands vary, consult owner’s manual for guidelines). When coals are medium, ash-covered (approx. 30 minutes), spread in single layer. Position cooking grid.

2. Season meat (directly from refrigerator), as desired. Place on cooking grid directly over coals.

3. Grill to desired degree of doneness, turning occasionally. After cooking, season with salt, if desired.
ON TOP OF THE STOVE, DRY HEAT COOKERY
METHOD FOR THIN, TENDER CUTS

PAN-BROILING

1. Heat heavy nonstick skillet 5 minutes over medium heat.
2. Season meat (directly from refrigerator), as desired. Place in preheated skillet (do not overcrowd). Do not add water or oil. Do not cover.
3. Pan-broil to desired degree of doneness, turning once. Remove excess drippings from skillet as they accumulate. After cooking, season with salt, if desired.

TEXAS TECH

ALLOWS BROILING WHEN YOU DON’T HAVE AN OVEN

USE ONLY WHEN MEAT IS TOO DRY WITHOUT ADDED FAT

PAN-FRYING

1. Heat small amount of oil in heavy nonstick skillet over medium heat until hot.
2. Season meat (directly from refrigerator), as desired. Place meat in preheated skillet (do not overcrowd). Do not add water or cover.
3. Pan-fry to desired doneness, turning occasionally. After cooking, season with salt, if desired.

FRYING SIGNIFICANTLY INCREASES THE CALORIC VALUE OF FOODS OF ANY KIND AND INCREASES HUMAN WEIGHT PROBLEMS
Cubed steaks should be fried to prevent dryness resulting from their open structure.
### FOR SMALL, THIN PIECES OF MEAT

**STIR-FRYING**

1. Partially freeze meat for easier slicing. Cut into thin, uniform strips or pieces. Marinate to add flavor or tenderize, if desired.

2. Heat small amount of oil in wok or heavy nonstick skillet over medium-high heat until hot.

3. Stir-fry meat in half-pound batches, continually turning with scooping motion, until outside surface of meat is no longer pink (Cook meat and vegetables separately, and then combine and heat through.)

---

### MAIN COOKING METHOD CATEGORY

**MOIST HEAT**

**Surround the meat with either steam or hot liquid in a closed vessel.**
WHEN TO USE MOIST HEAT METHODS

MOIST HEAT SHOULD BE USED ON LESS TENDER MEAT CUTS BECAUSE IT HAS A TENDERIZING EFFECT - TOUGH CONNECTIVE TISSUE IS SOLUBILIZED TO TENDER GELATIN

COOKING METHODS

BRAISING - FOR THIN, LESS TENDER CUTS SUCH AS FLANK STEAKS OR ARM STEAKS OF BEEF
MOIST HEAT COOKERY METHOD FOR THIN CUTS

**BRAISING**

1. Slowly brown meat on all sides in small amount of oil in heavy pan. Pour off drippings. Season, as desired.

2. Add small amount (1/2 to 2 cups) of liquid (e.g., broth, water, juice, etc.).

3. Cover tightly and simmer gently over low heat on top of the range or in a 325°F oven, until meat is fork-tender.

Note spelling - “brazing” is a kind of welding.

SAME AS BRAISING EXCEPT FOR THE AMOUNT OF LIQUID USED

COOKING IN LIQUID - FOR THICK, LESS TENDER CUTS SUCH AS HEEL-OF-ROUND OR ARM POT ROASTS. COULD BE CALLED “POT ROASTING”
COOKING IN LIQUID (STEWING)

ALSO CALLED STEWING IF MEAT PIECES ARE SMALL

MOIST HEAT COOKERY METHOD FOR THICK CUTS

1. Coat meat lightly with seasoned flour, if desired. Slowly brown on all sides in small amount of oil in heavy pan. Pour off drippings.

2. Cover meat with liquid (e.g., broth, water, juice, etc.). Add seasoning, as desired. Bring liquid to boil; reduce heat to low.

3. Cover tightly and simmer gently over low heat on top of range until meat is fork-tender.
• Because moist heat cookery is used, you must add flavoring agents to the food to make it taste better.
• An excellent cooking method when the cook works outside the home.
• Start the cooking before you leave for work and have a delicious meal ready when you return.
• For food safety purposes, the cooker should be set on “high” until the food gets hot and then turned to”low”. 
A MICROWAVE OVEN NEEDS A TURNTABLE TO PROMOTE UNIFORM COOKING

HOW DO MICROWAVE OVENS WORK?

- A magnetron generates radar waves.
- They are stirred as they enter the oven.
- They bounce from wall to wall until dissipated or they enter food.
- They heat by exciting water molecules and creating friction.
- A dry substance will not heat.
- Surfaces do not get hot enough to brown.
EGG WHITE PARTIALLY COOKED IN TWO MICROWAVE OVENS (1 & 2)

WHERE ARE THE HOT AND COLD SPOTS?

COOKING A STEAK ON A BROWNING DISH IN A MICROWAVE OVEN

Meat cooked in a microwave oven scores about 0.5 point lower than when cooked by broiling or roasting, but it’s fast.

ASFT DEPT. - MEAT SCIENCE

TEXAS TECH
WHAT CAUSES DIFFERENT MUSCLE APPEARANCE AT VARYING TEMPERATURES?

• Myoglobin changes from a reddish to brownish color at 149°F.
• Thus, in cooking meat the surface regions will be hotter and change color before internal regions.

CHANGE IN COLOR FROM MEDIUM RARE TO MEDIUM TO WELL DONE

SEE PAGE 55
WE CAN TAKE ADVANTAGE OF THIS KNOWLEDGE

• If we cook large roasts slowly, more time will be available for pigment change at or near 149°F.
• Thus, we can have a well done appearance (that some people require) but have the increased juiciness and tenderness that a lesser state of doneness allows.
(i.e., we can have a well done appearance at a less than well done temperature)

RECOMMENDED DEGREES OF DONENESS

<table>
<thead>
<tr>
<th>Meat</th>
<th>Medium-Rare</th>
<th>Medium</th>
<th>Well Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td>145°F</td>
<td>160°F</td>
<td>170°F</td>
</tr>
<tr>
<td>Veal</td>
<td>*</td>
<td>160°F</td>
<td>170°F</td>
</tr>
<tr>
<td>Lamb</td>
<td>145°F</td>
<td>160°F</td>
<td>170°F</td>
</tr>
<tr>
<td>Pork</td>
<td>*</td>
<td>160°F</td>
<td>170°F</td>
</tr>
<tr>
<td>Ground Meats</td>
<td>*</td>
<td>160°F</td>
<td>170°F</td>
</tr>
</tbody>
</table>

*Not recommended for less than medium degree of doneness.
DON’T OVERCOOK MEAT

Generally, the longer meat is cooked, the less juicy it becomes.

COOKING LOSSES INCREASE WITH COOKING TIME AND TEMPERATURE

Therefore, those who eat meat which is "rare" in doneness eat juicier meat than those who eat "medium" or "well-done" meat.
VARIABLE EFFECTS OF HEAT

MUSCLE FIBERS BECOME TOUGHER WITH LONGER COOKING, BUT CONNECTIVE TISSUE TENDS TO BECOME MORE TENDER

LESS DONE, MORE JUICINESS & TENDERNESS

THUS, A "RARE" STEAK USUALLY IS MORE TENDER THAN ONE COOKED MORE WELL-DONE
"You want my escargot? They're too rare for me."

**DIAL AND STEM THERMOMETERS**

- More accurate, but fragile
- More durable but most have plastic dial covers that melt in heat

TEXAS TECH

ASFT DEPT. - MEAT SCIENCE
They contain an alcohol that is non-toxic. However, this alcohol column tends to separate into segments with use.

Many microwave ovens have a built-in temperature probe.

LESS EXPENSIVE MODELS ARE AVAILABLE FOR HOME USE
USING A METAL SKEWER TO MAKE A HOLE FOR THE MEAT THERMOMETER

Insert the thermometer’s tip in the geometric center of the roast or steak but not against bone or in fat.

MEASURE SO THAT YOU CAN PLACE THE TIP OF THE THERMOMETER HALF WAY THROUGH THE ROAST
The internal temperature of steaks and roasts will increase 5 to 10° after the meat is taken from the heat. Allow for this increased doneness.
INSERT THE THERMOMETER FROM THE EDGE OF STEAKS, CHOPS OR HAMBURGERS

This farberware grill is excellent for home use - an exhaust hood above it is not necessary

TEMPERATURE AT THE MEAT ON A FARBERWARE GRILL IS ABOUT 300°F - NEAR IDEAL

An opening in the bottom allows air circulation and prevents overheating
INTERNAL TEMPERATURE DEVICE IN A TURKEY BREAST TO BE ROASTED

The spring-loaded plunger pops up when the temperature is sufficient to melt the wax around the plunger.

Is not very useful - you would have to look at it frequently to see if it had emerged.

RESTAURANT CHEFS CLAIM THEY CAN DETERMINE DONENESS BY DEPRESSING THE COOKING MEAT WITH A SPATULA

• The amount a cut of meat depresses depends on its doneness (more done, less depression), but the problem is that meat varies greatly in firmness.
• If this pressure method of determining doneness always “worked,” we would receive meat with the doneness we order in restaurants.
FOR HEALTH’S SAKE, DON’T CHAR MEAT!!!

• Some Japanese research shows that charring meat may produce carcinogens.

• So, don’t overcook meat or cook with too much heat that produces charred areas.

• Don’t cook with flames when charcoaling. If a fire erupts, have water handy to douse it.

NOT EATING TRIMMABLE FAT REDUCES CALORIES BY 346 & CHOLESTEROL BY 60 mg IN JUST ONE STEAK

Trim the fat before you cook because the fat migrates to muscle during cooking.
THE MEAT IS DONE BUT WE’RE NOT READY TO EAT - WHAT DO I DO?!?!?!?!?!

• When cooking large cuts such as roasts, hams, turkeys, etc., if the meat gets done too soon, wrap it in foil and a towel and put it in a cooler. If you don’t have a cooler, wrap it in foil and layers of cloth. It will stay warm for hours.

• Do smaller cuts the same way but for shorter times.

• It is better to have roasts done early because they need to “set up” at least a few minutes before being carved.

WITH PROPER PROCESSING & COOKING, HOT PROCESSED PORK IS MORE PALATABLE THAN COLD PROCESSED

MICROWAVE         MICROWAVE          WATER BATH                 COLD
-------------------- HOT PROCESSED  ---- --------------
EFFECTS OF CONVENTIONAL AND MICROWAVE OVEN REHEATING OF PRECOOKED PORK PRODUCTS

PROCEDURE IN TTU PORK CHOP RESEARCH BY KERSH AND RAMSEY

- Pork loin chops were cut 1/4, 1/2, 3/4 and 1 inch thick.
- They were cooked by broiling, frying or microwaving.
- Doneness was determined visually or with a meat thermometer.
- A trained sensory panel evaluated tenderness, juiciness and flavor.
COMPARING COOKING METHODS

RESEARCH ON COOKING OF PORK CHOPS BY RAMSEY ET AL. AT TEXAS TECH UNIV.: BROILING PRODUCED MORE TENDERNESS FRYING PRODUCED THE BEST FLAVOR MICROWAVES PRODUCED SLIGHTLY LOWER PALATABILITY RATINGS

IF YOU DON’T HAVE A MEAT THERMOMETER, GET ONE!!!!

CHOP THICKNESS DID NOT AFFECT PALATABILITY IF A THERMOMETER WAS USED TO DETERMINE DONENESS
YOU CANNOT TELL WHEN MEAT IS DONE BY LOOKING AT ITS SURFACE

WHEN EXTERNAL APPEARANCE WAS USED AS THE ENDPOINT FOR COOKING, THIN CHOPS WERE OVERCOOKED AND THICK CHOPS WERE UNDERCOOKED

WHEN MEAT IS WRAPPED IN ALUMINUM FOIL, MOIST HEAT IS USED - FLAVOR

TWO USES FOR ALUMINUM FOIL:

USE WHEN ROASTING AT A HIGH OVEN TEMPERATURE (400°F OR 205°C+)

COVER ENDS OF WINGS AND DRUMSTICKS OF ROASTING POULTRY

BOTH USES PREVENT CHARRING OF THE MEAT
## COOKING DATA FOR 12-LB. HAMS

<table>
<thead>
<tr>
<th>COOKING METHOD</th>
<th>OVEN TEMP °F</th>
<th>COOKING TIME, MIN. PER LB.</th>
<th>COOKING LOSS, %</th>
<th>PALATABILITY RANKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROASTED IN ALUMINUM FOIL</td>
<td>400</td>
<td>17</td>
<td>24</td>
<td>5&lt;sup&gt;TH&lt;/sup&gt;</td>
</tr>
<tr>
<td>ROASTED UNCOVERED</td>
<td>400</td>
<td>16</td>
<td>28.5</td>
<td>3&lt;sup&gt;RD&lt;/sup&gt;</td>
</tr>
<tr>
<td>ROASTED COVERED</td>
<td>350</td>
<td>22</td>
<td>19</td>
<td>4&lt;sup&gt;TH&lt;/sup&gt;</td>
</tr>
<tr>
<td>ROASTED UNCOVERED</td>
<td>250</td>
<td>32</td>
<td>10</td>
<td>2&lt;sup&gt;ND&lt;/sup&gt;</td>
</tr>
<tr>
<td>ROASTED UNCOVERED FROM FROZEN STATE</td>
<td>250</td>
<td>64</td>
<td>8</td>
<td>1&lt;sup&gt;ST&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

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## WHAT ABOUT COOKING BAGS FOR ROASTING?

- **Do not** use cooking bags
- They insulate, wasting energy and your money
- They trap steam, shifting from roasting to braising with the trapped steam
- Braising tenderizes but greatly harms the meat flavor
- Meat should be naked during roasting

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# EFFECTS OF COOKING SPEED & DONENESS - DATA COLLECTED IN ANSC 3201 LABS

<table>
<thead>
<tr>
<th>COOKING METHOD</th>
<th>INTERNAL TEMP., °F</th>
<th>COOKING LOSS, %</th>
<th>WBS VALUE</th>
<th>SENSORY PANEL SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BROILING</td>
<td>155</td>
<td>19.3</td>
<td>7.7</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.6</td>
</tr>
<tr>
<td>BROILING</td>
<td>180</td>
<td>30.2</td>
<td>9.2</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.0</td>
</tr>
<tr>
<td>CHARCOAL GRILLING</td>
<td>155</td>
<td>13.4</td>
<td>5.7</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.6</td>
</tr>
</tbody>
</table>

Compare lines 1 and 2. The only difference is the doneness: 155 vs. 180 internally. **How did the greater doneness change the meat?**

Compare lines 1 and 3. Only differences are charcoal and a slower cooking w/charcoal.

---

**SUMMARY**

*Select correct cooking method for each meat cut.*

*Cook slowly.*

*Use a meat thermometer when cooking with dry heat.*

*Don’t overcook.*
MEAT TENDERIZERS

- Enzymes that degrade proteins and tenderize meat.
- Review information given earlier
- Papain is most widely used
- In home situations, any tenderizer is difficult to incorporate into the meat beyond about a 1/4-inch depth.
- Commercially, enzyme solutions can be pumped into meat cuts.

INGREDIENTS OF A MARINADE

MARINADE - USED TO MARINATE MEAT CUTS, AMOUNT SUFFICIENT TO MARINATE 4 BEEF STEAKS, 6 PORK CHOPS OR 10 LAMB CHOPS:

- COOKING OIL - 1/2 CUP
- LEMON JUICE, COOKING SHERRY, WINE OR VINEGAR - 2 TSP.
- BLACK PEPPER - 1/4 TSP.
- MARJORAM - 1 TSP.
- GINGER (OPTIONAL) - 1/4 TSP.

TOO SALTY TO DRINK
HOW TO USE A MARINADE

• Mix the marinade and coat all surfaces of the steaks or chops.
• Leave in the refrigerator for 4 to 24 hours.
• Re-coating of the meat with the marinade is desirable.

ADVANTAGES OF MARINATING

• Increases juiciness coming from the oil in the marinade
• Increases flavor coming from the spices
• Surface tenderness may be increased by the lemon juice or similar ingredient
• Downside: calorie count will be increased because of the added fat
**INGREDIENTS FOR A GOOD CHICKEN BBQ SAUCE - IMPARTS A GOLDEN COLOR**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>For 4 halves</th>
<th>For 100 halves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cider vinegar</td>
<td>1 cup</td>
<td>1 gallon</td>
</tr>
<tr>
<td>Cooking oil</td>
<td>1/3 cup</td>
<td>3 pt</td>
</tr>
<tr>
<td>Salt</td>
<td>4 tsp</td>
<td>2 cups</td>
</tr>
<tr>
<td>Tabasco sauce</td>
<td>2 tsp</td>
<td>4 bottles</td>
</tr>
<tr>
<td>Worcestershire sauce</td>
<td>3 tsp</td>
<td>2 bottles</td>
</tr>
<tr>
<td>Garlic powder (optional)</td>
<td>1/8 tsp</td>
<td>2 tsp</td>
</tr>
</tbody>
</table>

This sauce can be sprayed on cooking chicken.

---

**OUTDOOR COOKERY MADE EASY**

- Thousands of cartoons have been drawn poking fun at backyard “cooks” in a cloud of smoke.

- With a few key points, you can escape being a cartoon subject and can become an excellent backyard chef.
HOW IS SMOKED FLAVOR PRODUCED?

• Charcoal or gas grills produce smoked flavor on meat because the meat grease cooks out and drips on something hot, creating smoke.

• Grease dripping on hot metal would produce essentially the same flavor as charcoal or gas grills.

CHARCOAL VS. GAS AND WOOD CHIPS

• In previous years of this class, we determined that students could not tell the difference in flavor of pork chops cooked over charcoal and on gas grills.

• If you want a stronger smoked flavor, soak hardwood chips in water (so they will smolder and not flame) and place them on top of the charcoal or on top of the layer of rock-like material in a gas grill.
TEXAS GRILLS NEED “HATS”

• Because of an abundance of wind in many parts of the country, particularly Texas, you should purchase a grill with a lid.

• It will be cheaper in the long run if you buy a more heavily-constructed grill because they “rust out” more slowly.

• You don’t need a big grill for everyday family use.

AN IDEAL CHARCOAL GRILL FOR EVERYDAY FAMILY USE

CAST IRON BODY WITH STAINLESS STEEL GRILL

Two dampers to control heat

Milled edges on lid and bottom - air tight

Is about 30 years old and still going strong
GRILL WITH CHARCOAL REMAINING FROM THE PREVIOUS COOKING

STAINLESS STEEL GRILL

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TEXAS TECH

CHARCOALING KEY POINT

USE ONLY ENOUGH CHARCOAL TO COVER THE AREA UNDER THE MEAT TO BE COOKED

THESE BRIQUETTES WOULD HEAT ONLY THE AIR

WE DON’T NEED MORE “HOT AIR” IN TEXAS!

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TEXAS TECH
Each briquette then helps light the one touching it and they light more quickly.

Partially-burned briquettes from the previous cooking are in the bottom layer.
**APPLY LIGHTER FLUID GENEROUSLY**

Do **NOT** use gasoline unless you also want to be “lit”.

Kerosene and diesel fuel are OK to use.

---

**LEAVE THE LID OPEN WHILE THE CHARCOAL IS LIGHTING**

More $O_2$ causes faster combustion
CHARCOALING KEY POINT

ALLOW AT LEAST 20 MINUTES AFTER LIGHTING CHARCOAL BEFORE COOKING OF MEAT IS BEGUN

• This time allows all fumes from the lighting fuel to burn and prevents off-flavors in the meat from the fuel.

• Cooking is easier if the charcoal is hot before you begin.

6 MINUTES AFTER LIGHTING CHARCOAL - GRAY ASH APPEARING
15 MINUTES - NOT READY

26 MINUTES - READY TO COOK
THE EASIEST METHOD OF LIGHTING CHARCOAL IS BY BROILING IT

You must have an exhaust hood above the oven because charcoal smokes while lighting.
The pan’s finish will be ruined by the intense heat.

RACK IN TOP POSITION

CHARCOAL READY TO COOK AFTER BEING BROILED 3 MINUTES

TEXAS TECH
CHARCOALING KEY POINT

Always uniformly spread the charcoal across the bottom of the grill before cooking is begun.

Briquettes that touch create enough heat to cause flames from heated grease; one by itself does not.

USING TONGS TO SPREAD THE CHARCOAL

Don’t cook with flames that will char the meat.
LETTING THE GRILL HEAT BEFORE MEAT IS PUT ON

The grill will be wiped after it gets hot.

WIPE THE GRILL AFTER IT IS HOT

Heat from the charcoal will kill all microbes on the grill.

Washed grills rust more than unwashed grills.

THIS CAST STAINLESS STEEL GRILL DOES NOT RUST
KEY POINT: APPLY COOKING OIL TO PREVENT THE MEAT STICKING TO THE HOT METAL

Any edible oil or fat can be used to coat the grill.

COOKING AND PRODUCING THE SMOKED FLAVOR

Regulate the heat by opening or closing the dampers - more open produces more heat.
Closing the lid and shutting the dampers deprives the charcoal of oxygen, saving the remaining charcoal for the next cooking.

TURNING MEAT ONLY ONCE IS MOST DESIRABLE

- Best results in both palatability and cooking losses are obtained if meat is turned only one time during broiling and grilling. Cook one side, season the cooked side, and cook the second side until done.
- Season the cooked side because salt draws moisture from raw meat.
- To turn only once, you must have the heat at the correct level. Experiment!
For health purposes and ease of tending, a grill should never be made larger than this one: 1 x 2 x 3 ft. Let someone else build the “monster” that is a “killer” because of the cook having to breathe smoke and grease from the huge grill!

Corners are angle iron with a lip on the outside to keep the grill in place.

Heavy gauge sheet metal with edge turned at the top for strength.

Pipe legs slip into larger pipe sleeves welded to corners. Do not thread the legs - they will rust & not be usable.
INSIDE GRATE FOR HOLDING CHARCOAL RESTS ON A FLAT IRON FRAME AND HAS TURNED-UP EDGES

This design protects the sheet metal from the intense heat of the charcoal and prolongs the life of the grill.

WHEN USING A 1 X 2 X 3 FT. GRILL, A 10-LB. BAG OF CHARCOAL IS NEEDED

Cut the bag across the top of the ends and in the top center, but do not pour the charcoal out. Apply lighter fluid and let the bag keep the charcoal stacked for lighting.

After about a half hour, bring unburned paper to the top and then spread the charcoal before cooking.
GRILL TO HOLD THE MEAT IS MADE OF SMOOTH EXPANDED METAL

FRAME IS HEAVY-WALLED 1/2-INCH PIPE

CHECK YOUR TEXT

- See MWE for information about making concrete block grills
- See figure 24-12 about turning large quantities of cooking meat
WHAT ABOUT GAS GRILLS?

• Gas grills are handy - you don’t have to wait for charcoal to light and the heat can be regulated just by turning a dial.

• Downsides:
  – they are notorious for grease fires - accumulated meat grease burns & scorches the meat before you notice
  – most grills have hot and cold spots, depending on the burner design

MORE ABOUT GAS GRILLS

• You must have some material in place to protect the burner from dripping meat grease and more evenly distribute the heat from the burner.

• One such product that works well is ceramic and is called “devil’s anvils”.

• Do not use lava rock because the pockets in the rock hold grease and cause even more fires than other better products that have smoother surfaces.

• Charcoal may give more flavor, depending on how much smoke is generated.
PIT BARBECUING IS FOR LARGE CUTS OF MEAT

See the information on pages 1,013 and 1,014 in MWE if you have an interest in doing pit barbecuing.

Two most common pit BBQing mistakes:
• Not having the pit sealed well enough so that heat and steam escape
• Not allowing enough time for the meat to get done

WHAT ARE THE KEYS TO MATCHING RETAIL CUTS WITH THE PREFERRED COOKING METHODS?

• You must know where on the carcass the cut originated. If you learn lab materials, you will know the origins of cuts.
• Then learn what parts of the carcass are tender and tough (or intermediate)
• Tender ones need dry heat methods
• Tough ones need moist heat methods
• Lastly, learn cooking methods for thick and thin cuts and you have it!
BEEF PRESENTS MORE TENDERNESS PROBLEMS THAN VEAL, PORK OR LAMB

WHY?

All cuts except shanks and necks of pork and lamb can be cooked with dry heat.

FOR BEEF, CENTER OF THE BACK IS MOST TENDER

TRANSITION AREAS

MOST TENDER

LEAST TENDER
All lamb and pork cuts are tender except the shanks and neck. Why?

Dry heat cookery methods

Why no dry heat cookery choice?

Roasts are at least 1.5 inches thick; at least 2 inches is better.
Dry heat cookery methods are options for a lamb cut from the same location as the beef cut.

Lamb Shoulder Arm Chops

Broil, Pan-fry, Pan-broil, Braise
Cut from the arm portion of the shoulder. Contains cross section of round arm bone and rib bones.

Ditto for pork.

Pork Shoulder Arm Steak

Braise, Pan-fry, Pan-broil, Grill, Broil
Same muscle and bone structure as Arm Roast, but cut about 3/4 inch thick.
MOIST HEAT NOT NEEDED FOR THIS TENDER MIDDLE MEAT CUT OF BEEF

Grill, Broil, Pan-fry, Pan-broil
Same muscle structure as Rib Roast Small End, usually cut about 1 inch thick.

DITTO FOR LAMB

Grill, Broil, Pan-fry, Pan-broil
Same as Rib Chops, but lean and fat from end of rib bone has been removed, exposing about 1 inch of bone.
AND PORK

Pork Loin Rib Chops

- Grill, Broil, Pan-fry, Pan-broil
- Contains loin eye muscle, backbone and part of rib bone. Usually cut \( \frac{3}{4} \) to 1 inch in thickness.
- \( ^{\dagger} \) May be labeled as Pork Loin Center Cut Chops

THE BLADE REGION OF BEEF NEEDS EITHER DRY OR MOIST HEAT COOKERY DEPENDING ON THE MEAT QUALITY

Beef Chuck Blade Roast

- Contains blade bone, backbone, rib bone, and a variety of muscles. Usually cut about 2 inches thick.
- (Braise, Roast)
THIS BEEF CUT IS FROM A TRANSITION AREA (NOT TOUGH OR TENDER) ON THE CARCASS

IF CHOICE OR PRIME

THE SAME INFORMATION APPLIES TO RUMP ROASTS

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WHICH BEEF CUTS ARE MOST LEAN?

<table>
<thead>
<tr>
<th>Meat Type</th>
<th>Calories</th>
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<tr>
<td>Tenderloin Steak</td>
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<tr>
<td>Top Round Steak</td>
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<tr>
<td>Very Lean Cubed</td>
<td>180</td>
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<tr>
<td>Sirloin Steak</td>
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<td>Flank Steak</td>
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<td>Top Sirloin Steak</td>
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<td>Rib Roast</td>
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<td>Eye of Round Roast</td>
<td>155</td>
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<tr>
<td>Bottom Round Roast</td>
<td>159</td>
</tr>
</tbody>
</table>

HOW SHOULD VARIETY MEATS BE COOKED?

Most variety (organ) meats are not tender. Does this fact give us a lead about proper cooking methods?
WHAT COLLEGE PROFESSORS HAVE TOO MUCH OF!

THEIR TOUGHNESS NECESSITATES USING MOIST HEAT COOKERY OR GRINDING FOR SAUSAGES

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HAVE A HEART!

MOST HEARTS ARE EXPORTED OR USED IN SAUSAGES IN THE U.S.

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HOW WOULD YOU COOK KIDNEYS?

NOTE SPECIES DIFFERENCES IN CONFIGURATION

ANSWER: BOIL THE PEE OUT!!!!

LIVERS - LAMB LIVER OFTEN IS SOLD AS CALF LIVER. WHY?

HOW CAN YOU TELL THE DIFFERENCE BETWEEN LAMB AND CALF LIVERS?

Texas Tech

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WHAT COLLEGE STUDENTS NEED TO USE MORE!

SWEETBREADS - THE THYMUS GLAND OF YOUNG BOVINE. SAUTE THEM.

SOME PEOPLE LIKE BRAINS AND SCRAMBLED EGGS

ALSO CAN BE OBTAINED FROM THE PANCREAS OF SWINE

THE END

TEXAS TECH

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