## Inspection vs. Grading

- Inspection is a mandatory process, while grading is voluntary.
- Government inspection
  - HACCP-based for all plants, even small
  - paid by consumers
  - responsible for 3 areas
    - ante-mortem, health
    - Processing visual, microbiological, chemical, composition
    - Post-mortem, health, disease, labeling





## Quality and Yield Grade: What's It Supposed To Mean?







ProStart: Teaching Beef in the Classroom Georgia Beef Council The University of Georgia Alexander Stelzleni 7-19-11





**Moderately Abundant** 



Slightly Abundant



Moderate







Modest

Small

Slight

## Maturity and Chronological Age



## **Beef Quality Grading**

REL	ATIONSHIP BETWEE	N MARBLING,	MATURITY, AND CA	ARCASS QUALITY G	RADE <sup>1</sup>
DEGREES OF MARBLING	MATURITY <sup>2</sup>				
	A <sup>3</sup>	В	С	D	E
Abundant					
Moderately Abundant	PRIME				
Slightly Abundant				COMMERCIAL	
Moderate					
Modest	CHOICE				
Small				UTILITY	-
Slight	SELECT			906	
Traces					
Practically Devoid	STANDARD			CUTTER	

<sup>1</sup>Assumes that firmness of lean is completely developed with the degree of marbling and that the carcass is not a "dark cutter." <sup>2</sup>Maturity increases from the left to right (A through E).

<sup>3</sup>The A maturity portion of the figure is the only portion applicable to bullock carcasses.

What's the no. 1 reason your customers order BEEF?

TASTE!!! (Or Palatability)

-What influences Taste and Satisfaction

- Tenderness #1
- Juiciness
- Flavor
- Younger, higher marbling carcass usually have it



## **Degree of Marbling**

Slightly Abundant Abundant



## Tenderness: Striploin Steaks by Quality Grade



Shear Force (kg)

Source: George et al., 1997

## **Eating Satisfaction**



<sup>1</sup>Assumes that firmness of lean is completely developed with the degree of marbling and that the carcass is not a "dark cutter." <sup>2</sup>Maturity increases from the left to right (A through E).

<sup>3</sup>The A maturity portion of the figure is the only portion applicable to bullock carcasses.

## How Do Customers Like Their Steak?



Source: National Livestock and Meat Board

## Can you guarantee an overcooked steak??

- Marbling Contributes
  - Lubrication
  - Insulation
  - Muscle Fiber Dilution and Taste (flavor)
  - Strain







Moderately Abundant

Slightly Abundant

Moderate Upper Choice





Small



Modest

Slight

Upper Choice Low Choice Select

## **USDA Yield Grades**



## **USDA Yield Grade**

- Tells us...
  - The Percent of Boneless Closely Trimmed Retail Cuts, that can be expected out of the carcass
  - Based on ratio of Lean to Fat
  - -YG1 at least 52.3%
  - -YG2
  - -YG3
  - -YG4
  - -YG5

- 50.0 52.3%
  - 47.7 50.0%
  - 45.4 47.7%
  - less than 45.4%

Which is more valuable a YG 2 or YG 5?













## **Yield Grade Basics**

- Fat Thickness 12<sup>th</sup> Rib Preliminary Yield Grade
- Rib Eye Area
- Hot Carcass Weight
- Kidney, Pelvic & Heart Fat



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Adopted from: R.E. Taylor. Scientific Farm Animal Production. 4th Ed. 1992.



44%

Adopted from: R.E. Taylor. Scientific Farm Animal Production. 4th Ed. 1992.



















## Yield Grade 2 Yield Grade 5





























## YG 1 vs YG 5 Ribeye



Adopted from: Meat Evaluation Handbook. 1997. Amer. Meat Sci. Assoc., Savoy, IL.











YG5

## Yield Grade

## • USDA Yield Grade 3 or lower

BenefitLess fat trim/plate waste

## **Other Issues**

#### MYTH: Meat has too much fat, saturated fat and calories.

BEE

**FACT:** There are lean cuts of beef that are low in fat and saturated fat. In addition, half the fatty acides in beef are monosaturated, the same heart-healthy fat found in olive oil and known for its cholesterol-lowering ability. When taken into account, the amount of saturated fat in beef is comparable to that of chicken and fish.

# 3 oz. Lean meat (top round)153 calories25% of calories from fat1.4 grams saturated fat1.55 oz. Chocolate bar230 calories51% of calories from fat9.0 grams saturated fat

**MYTH:** Vegetarian diets are healthier than ones containing beef.

**FACT:** Eliminating red meat from the diet can compromise the intake of essential nutrients such as iron and zinc. Studies have linked deficiencies in these two nutrients to a meatless diet because the iron found in plant foods is not as abundant or easily absorbed by our bodies as the iron found in meat. Iron and zinc deficiencies can delay cognitive and physical development, as well as decrease immunity.



### **MYTH:** Beef cannot be part of a low-fat diet.

BEE

**FACT:** There are many lowfat beef cuts in the meat case today. In fact, there are seven cuts of beef that meet government guidelines for "lean" and "extra lean." These cuts have on average 6.2 grams of total fat and 2.3 grams of saturated fat per 3-ounce serving.



MYTH: We should limit the amount of beef we eat.

**FACT:** Beef is one of nature's best tasting multi-vitamins. It is an excellent source of protein, zinc, vitamin B12, selenium, and phosphorus. It is also the leading natual food source of heme iron in the American diet.

Many Americans aren't meeting their daily intakes of these nutrients, which is why it is important to eat a balanced and varied diet that includes beef.



### MYTH: Beef is hard to digest.

BEE

**FACT:** Digestibility refers to the proportion of a food that becomes available to the body as absorbed nutrients. Beef is highly digestible - in fact, 97% of beef is digestible, in comparison to 89% of flour and 65% of most vegetables.

However, many people equate digestibility with the length of time a food remains in the stomach. Beef and other protein foods remain in the stomach longer than fruits and vegetables - and consequently provide a feeling of fullness or satisfaction for a longer period of time. This effect results in long lasting energy and likely prevents over-eating at the next meal.





#### MYTH: Beef contributes to heart disease.

BEE

**FACT:** Beef can be a part of a heart-healthy diet. Half of the fatty acids in beef are monosaturated and championed for their heart-healthy properties.

In fact, a recent study demonstrates that people with high blood cholesterol can consume six ounces of lean red meat, five or more days a week, as part of a heart-healthy diet and lower their cholesterol levels.

Lean beef and chicken have similar effects on blood cholesterol, but beef offers even more nutrient benefits.





# Hormones, Antibiotics & Residues

# Do we use them in livestock production?

If used, what are the residual levels? Potential concerns to human health



## Hormones cont'd

- Why use hormones?
  - Increase weight gain
    - •\$\$\$\$\$

BEE

- Increase feed efficiency
  - feed less to get a lb. of gain
- Lower production costs
- Lower carcass fat percentage
  - anabolic agent  $\psi$  fat  $\uparrow$  protein





## Hormones cont'd

## Hormones used?

BEE

- Endogenous (naturally made in the body)
  - estrogen (called estradiol in vegetables)
  - testosterone
  - progesterone
- Synthetic
  - trenbolone acetate
  - zerenol
- All are FDA tested and approved!!!





BEE

## Public Concern cont'd

- Each hormone has a <u>mandated</u> <u>withdrawal time</u> (prior to slaughter)
- Although still monitored, residual levels is a **NON-ISSUE** 
  - FDA monitors the live animal approve hormones used
  - FSIS tests for residual levels





## Hormones cont'd

# SourceAmount<br/>(ng)Beef, non-implanted steer, 4 oz. raw1.2Beef, implanted steer, 4 oz. raw1.6

## 33% Increase - but how much is a ng?



## **A NANOGRAM**

- 1 BILLION NANOGRAMS IN A GRAM
- OR

BEEF

• 1 BLADE OF GRASS IN SANFORD STADIUM



## 1 SECOND IN 33 YEARS



## Hormones cont'd

480,000

Women, non-pregnant Men 136,000 Boys 41,800 Girls 54,000

# Women who ate non-implanted beef, 4 oz. 480,001.2

Women who ate implanted beef, 4 oz. 480,001.6



## Hormones: What is the risk?

 Estrogen is a component of all meats and plants.

BEEF

 When a growth promotant is fed to the animal it increases the estrogen found naturally in the meat by 0.7 nanograms.



**Daily Human Estrogen Production** 

Source: Noffman & Evers, 1986. (Presented as the summed production of Estrodoil-17ß and Estroil per 24 hour period.) Levels are taken from pre-pubescent boys and girls and non-pregnant women.

\* A nanogram is one billionth of a gram.

\*\* Will vary depending on a woman's monthly menstrual cycle.



## Hormones cont'd

## Source (1 serving) Amount (ng)

Cabbage, raw 2,700

Peas, raw 454

Eggs 990

BEEI

Milk 11

Soybean oil 1,680,000

(J. Food Protection 42:577-585)

## NON-ISSUE FOR MEAT GEORGIA TEAM



Source: Collins et al., 1989; Booth et al., 1960; Verdeal and Ryan, 1979. \*A nanogram is one billionth of a gram.



## Antibiotics cont'd

- Why use antibiotics?
  - To treat disease

BEEI

- To prevent disease
- Increase rate and efficiency of growth
  - poultry and veal on-going daily use



## Antibiotics cont'd

How are antibiotics administered?

BEE

- Injection: therapeutic (large doses for short term illness treatment)
- Feed additive: sub-therapeutic (small doses for longer term - increased feed efficiency and growth rate)
- Both types have <u>mandated withdrawal</u> <u>times</u> prior to slaughter (time it takes for the body to metabolize and excrete from the body)





## Antibiotics cont'd

- Antibiotics used?
  - Therapeutic no restrictions
  - Sub-therapeutic no penicillin permitted, tetracycline voluntary
  - Limit penicillin and tetracycline because used for humans
- Public Concerns
  - Residual levels
  - Super bacteria





## RESIDUE TESTING RESULTS FDA REPORTS

NUMBER TESTED	% FOUND POSITIVE FOR RESIDUE
85,083	.20
175,430	2.34
116,726	.20
AVG.	2.5
18,114	1.9
	1.8
	5.6
	NUMBER TESTED 85,083 175,430 116,726 AVG. 18,114

## **Questions?**

Alex Stelzleni, PhD University of Georgia Meat Science Technology Center astelz@uga.edu www.StelzLab.org

