



**Food Safety Issues  
Regarding Meat and Meat  
Products**

**Food safety** is a scientific discipline describing handling, preparation, and storage of food in ways that prevent foodborne diseases. This includes a number of routines that should be followed to avoid potentially severe health hazards.

**However,**

**Meat Hygiene** may be defined as expert supervision of all meat products with the object of providing wholesome meat for human consumption and preventing danger to public health

## Factors that contribute to food borne diseases are as follows:

Food from unsafe sources	12%
Improper storage temperature	63%
Poor personal hygiene	28%
Contaminated equipment	23%
Inadequate cooking	21%
Other things	20%

### MEAT & POULTRY: A RISK PYRAMID



This total is over 100%

# PERCENT OF FOODBORNE DISEASE OUTBREAKS

- ❖ BACTERIAL 66%
- ❖ VIRAL 5%
- ❖ PARASITIC 5%
- ❖ CHEMICAL 25%



**If a food product is temperature abused,  
one bacterial cell can form 1 billion cells  
in 8 hours**

***Remember life begins at 40,  
Not in years but in temperature!***



# Food Safety: Consumer's Role

- Keeping food safe
  - Clean
  - Separate
  - Cook
  - Chill



## Characteristics of Growth for Nine Pathogens Associated with FOOD Products

<b>Pathogens</b>	<b>Temp for growth</b>	<b>pH</b>	<b>Minimum Aw</b>
<i>Bacillus cereus</i>	41-118.4 °F	4.9-9.3	0.912
<i>Campylobacter jejuni</i>	86-116.6 °F	4.9-7.5	--
<i>Clostridium botulinum</i> (Types A, B, E)	<b>37.9-114.8 °F</b>	>4.6	0.94
<i>Clostridium perfringens</i>	59-122 °F	5.0-8.3	0.95
<i>Escherichia coli</i> 0157:H7	50-112.1°F	4.5-9.0	--
<i>Listeria monocytogenes</i>	<b>33.8-113 °F</b>	4.4-9.6	0.90
<i>Salmonella</i>	41-114.8 °F	4-9	0.94
<i>Staphylococcus aureus</i>	43.7-114.8 °F	4.5-9.3	0.83
<i>Yersinia enterocolitica</i>	<b>32-113 °F</b>	4.2-9.6	0.94

As a result of the food infection problems in the 1990's, congress passed a bill which mandated that each food producing plant under Federal or State inspection must develop a Sanitation Standard Operating Procedure It must be followed daily. This started in 1997.

The Hazard Analysis and Critical Control Point program (**HACCP**) followed a year later.



This HACCP program was designed to **eliminate, control or reduce food borne disease**. Each food product produced was required to have a HACCP program.



The HACCP program has been very effective in reducing **foodborne disease**, as shown by the following data:



HACCP  
HACCP  
HACCP  
**HACCP**  
HACCP



From 1998 to 2010  
*Salmonella* = 17%  
*E-coli 0157:H7* = 42%  
*Campylobacter* = 28%

# Carcass sanitizing is being done extensively using

Lactic acid, acetic acid, or citric acid prior to chilling. These acids can be used between 2 ½% to 5% as a spray.



This technology has been very effective in reducing carcass contamination. Post chilling spraying has also been incorporated into the HACCP programs using peroxyacetic acid, lactic acid or lactoferen (a milk product). This program has been very beneficial in reducing contamination.



Each plant producing ground beef will be sampled at least one time per week by **USDA Food Safety & Inspection Service (FSIS)**.



These samples will be tested for *E. coli* 0157:H7 and *Salmonella*.

To enhance the testing program, beef trimmings prior to grinding may be selected instead of ground beef.

Ready to eat product (cooked to 140°F or more) if processed further such as slicing or deboning it must be tested for Listeria.



**This testing may occur on the product or on the surface of the equipment being used for further processing.**

**Since 1967, FSIS has administrated the National Residue Program to collect data on chemical residues in domestic and imported meat, poultry and processed eggs.**

**This plan has been intensified by FSIS and consists of two plans: domestic and imported. The domestic sampling will be increased and random samples will be collected from animals that appear healthy.**

The carcass that is sampled at the plant must be held pending results of testing. If positive--  
FSIS will contact the Food and Drug Association and work together to find the cause

# Human Health Issues

Beef is an excellent source of high biological value **protein**, a significant source of long-chain omega-3 **fatty acids**, of **vitamins** (A, B6, B12, D, E) and have a high bioavailability forms of **essential minerals** and trace elements such as zinc, copper and iron.



The relative proportion of nutrients and the fatty acid composition of adipose and muscle tissues can be affected by **factors such as diet, species, fatness, age/weight, depot site, gender, breed, season and hormones.**

# New findings regarding the pros and cons about the consumption of meat

- ❖ **Epidemiological studies in the 1990's suggested a positive correlation between fat intake and the incidence of breast-, colon-, and prostate cancer.**
- ❖ **However, longer recent case studies and the pooled analysis of the case studies failed to detect a correlation between fat intake and colon cancer.**
- ❖ **For breast cancer, no overall correlation could be found, for total intakes over the range of 15% to 45% of energy from fat.**
- ❖ **For prostate cancer, results were controversial- 5 or more servings per week of red meat could enhanced prostate cancer, whereas 2 to 4 servings did not promote prostate cancer.**

The overall impressions and conclusions of nearly all recent **meat consumption studies**



Studies indicate that a **low to moderate meat intake is beneficial** (due to its content of selected **antioxidants** and/or **anti-carcinogenic macronutrients with high bioavailability**)

Thus, **meat** as a part of a **mixed and balanced diet** can be **strongly recommended**.



## Remember These Facts About The Importance Of Meat In Nutrition

Meat products belong to one of the six major food groups. Poultry, red meat, and fish all provide the body with essential nutrients, minerals and vitamins in order for it to remain healthy.

Recently, there has been public controversy concerning just how healthy eating meat on a daily basis really is, especially red meat.

It's argued the consumption of red meat directly links to heart diseases and even cancer. Meanwhile, fears have grown about the amount of fat in all meats, particularly saturated fat.

So, what are the facts???



Thanks for listening!  
Any questions?



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