

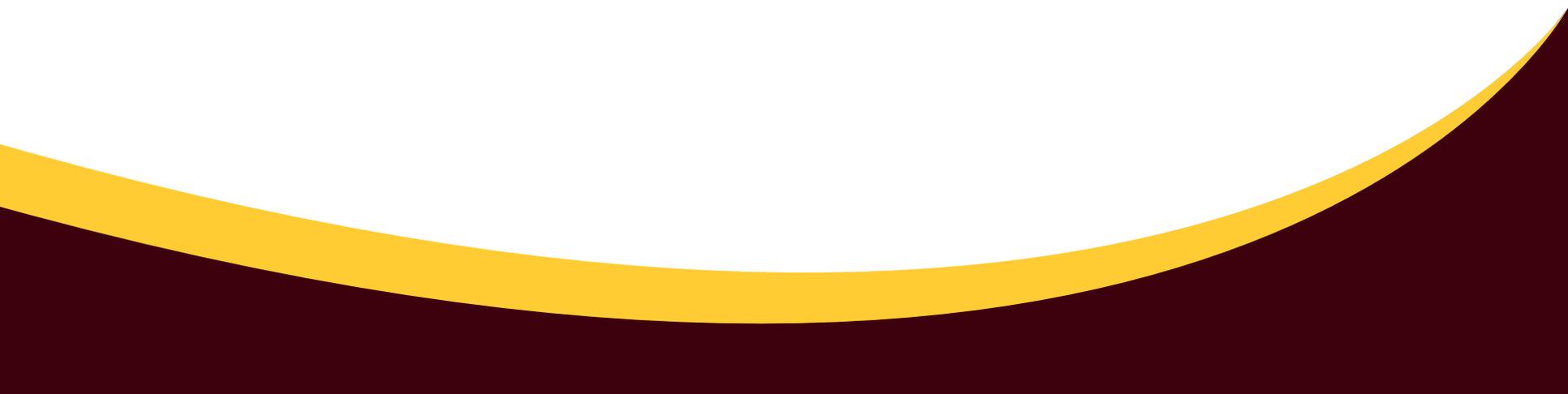
# Meat Processing Considerations



**Ryan Cox, Ph.D.**  
**Assistant Professor, Meat Science**  
**Department of Animal Science**  
**University of Minnesota**



# Outline

- **Processing Choices**
  - **Transportation to Processor**
  - **Questions to Ask Processors**
  - **Common Pitfalls**
  - **Resources Available to You**
- 



# Processing Choices

- Marketing strategy will influence your options on how your animals are processed
- **MUST** ask the question: “Are you selling animals or are you selling meat?”



# Processing Choices

- **Selling Animals**
  - **On-Farm Sales**
  - **Private Sales**
  - **Sides, Quarters etc.**
  - **Marketing Agreement with Processor**
- **You are paying of the service of slaughter, processing packaging, etc.**
- **How do you handle offal, hide credits, storage, etc.?**



# Processing Choices

- **Selling Meat**
  - Sold in retail at processor
  - Wholesale to restaurant, institution, second party for re-sale
- You are selling the animal to the processor
- May have marketing agreement with processor
- Does this account for entire carcass?



# Processing Choices

- **USDA-inspected**
- **State-Inspected (“Equal To”)**
- **Custom-Exempt**
- **On-Farm (poultry)**





# Processing Choices

**Federal Inspection: Operators who produce their meat products in Minnesota and sell their products in Minnesota and other states, or will export them to other countries, must be inspected by the USDA Food Safety and Inspection Service (FSIS). These businesses may harvest their own animals, or may purchase products from other USDA inspected sources and further process these products under continuous inspection.**





# Processing Choices

**State Inspection: Operators who produce and sell their products only in Minnesota can be inspected by the State Equal-To inspection program. These businesses may harvest their own animals or purchase products from either USDA or State inspected sources for further processing in their facility.**





# Processing Choices

- **MN Program was started in 1999 – other states have had a program since early 1970's**
  
- **53 facilities under inspection**
  - **Slaughter**
    - 21 beef and/or pork
    - 4 poultry
    - Most of these process
  - **29 only further process**

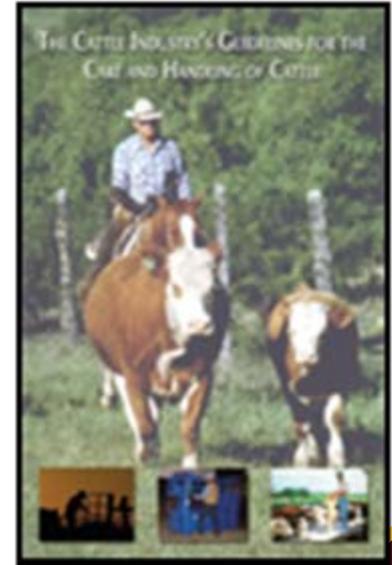
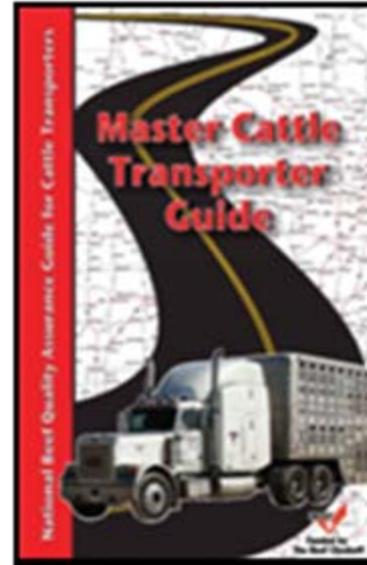
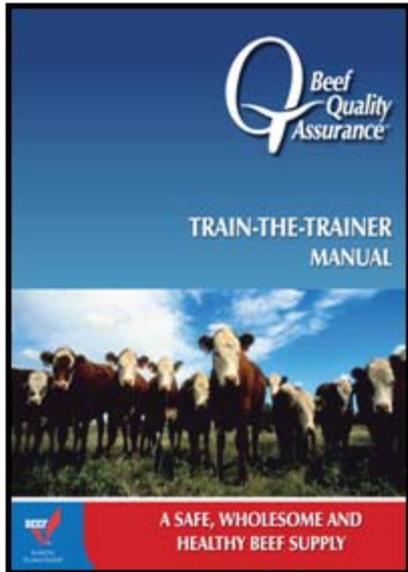


# Processing Choices

## Custom Exempt:

- The customer(s) maintain ownership of the animal through processing
  - Paying for the service of slaughter, fabrication, packaging, labeling, storage
  - Product is only intended for the animal owner and their house guests
  - NOT FOR SALE**
- 

# Transportation to Processor



# Transportation to Processor





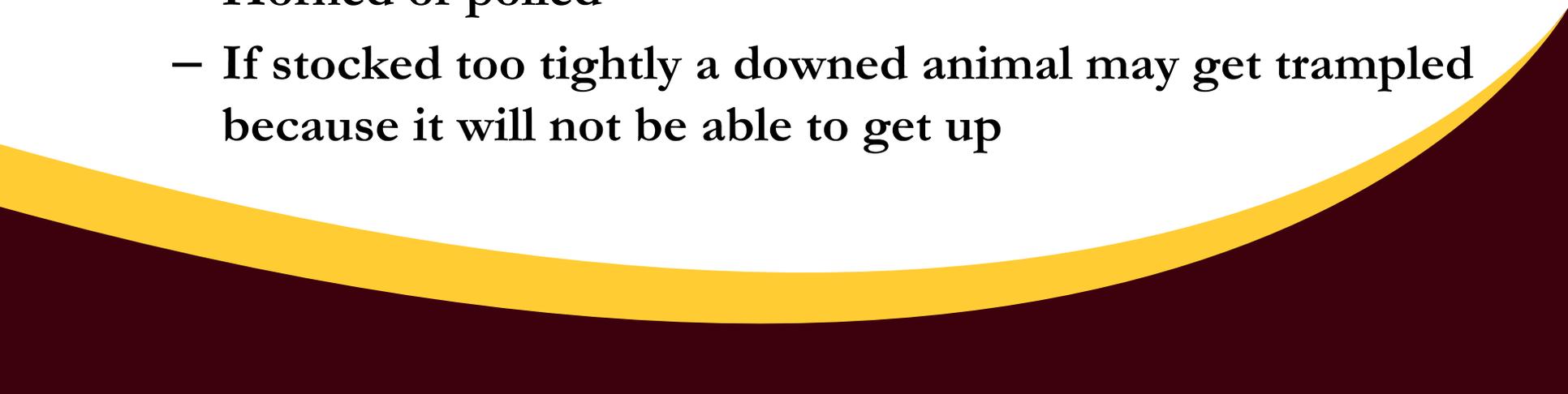
# Transportation to Processor

- Trailers should be kept in good repair.
- Sufficient height between decks to prevent back injuries





# Transportation to Processor

- Pigs and sheep
    - Transported for a few hrs can remain standing
    - Long distances, need enough space to lie down
    - May need more space on extremely hot days
  - Cattle
    - Should remain standing during journey
    - Horned or polled
    - If stocked too tightly a downed animal may get trampled because it will not be able to get up
- 



# Transportation to Processor

- Wind chill
  - When a truck is moving 50 mph on a 20-degree F (-7C) day, the wind chill factor for pigs is minus 23 degrees F (-31 C).







# Questions to Ask Processors

- **Days(s) that the facility slaughters?**
  - **Inspection restriction**
- **How far ahead you have to plan/schedule slaughter?**
- **Do they slaughter Beef? Pork? Lamb? Goat? Poultry? Bison? Rabbits?**



# Questions to Ask Processors

- **Minimum/maximum animal numbers?**
  - **Per shipment?**
  - **Per slaughter?**
  - **Per year?**
- **Kosher? Halal? Organic Certified?**

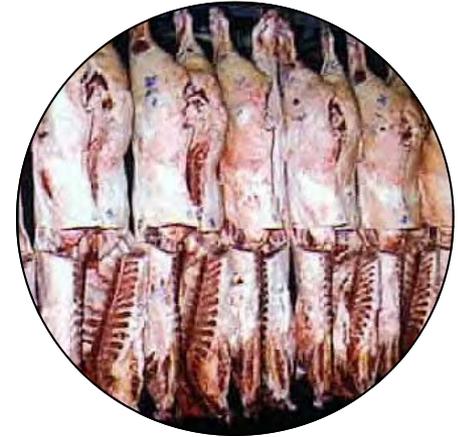


# Questions to Ask Processors

- Who will dispose of offal?
  - Will you market organ meats?
    - Does the facility salvage these?
  - Will you take the hide or receive drop credit?
  - Maintain animal identification?
- 

# Questions to Ask Processors

- Air chilled or water chilled (poultry)?
- Dry aging of beef carcass?
  - Commonly 10-14 days for benefit
  - May be 4-6 weeks or longer
  - Understand product loss
- Pork, lamb, goat and poultry not typically aged



# Questions to Ask Processors

## Fresh Meat Fabrication



- Does the processor work with the cuts you want?
  - Eg. Flat iron, Teres Major, Sierra Cut vs. Chuck Roast
- How much bone are you trying to sell?
  - Eg. T-Bones and Porterhouses vs. New York Strips and Tenderloin Steaks

# Questions to Ask Processors



## Processed Meat Fabrication

- Does the processor make the products you want?
  - eg. Summer Sausage, Jerky, Snack Sticks, Cured Hams, Bacon, Bratwurst, Fully Cooked Items?
- Does your animal provide the proper meat block for these further processed products?
  - Many sausages are not single species formulas
  - Very lean carcasses are not suitable for sausage

# Questions to Ask Processors



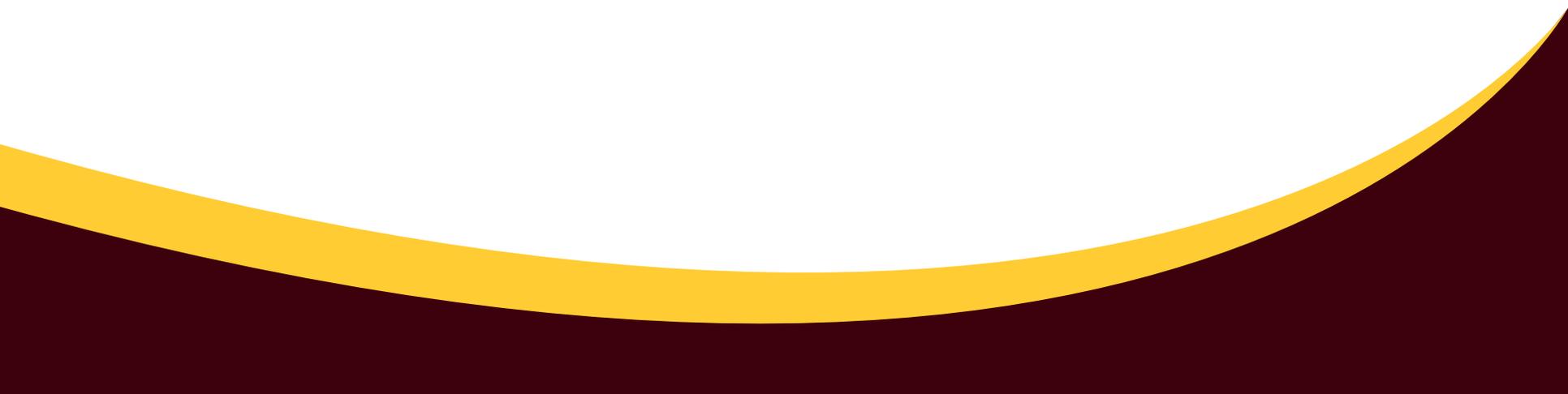
## Processed Meat Fabrication

- Do you have a recipe for the products, or will you work with the processor to develop a flavor profile?
- What are the costs of all non-meat ingredients and further processing?
- What is the timeline for further processed products?
  - Longer processing time than fresh meat



# Questions to Ask Processors

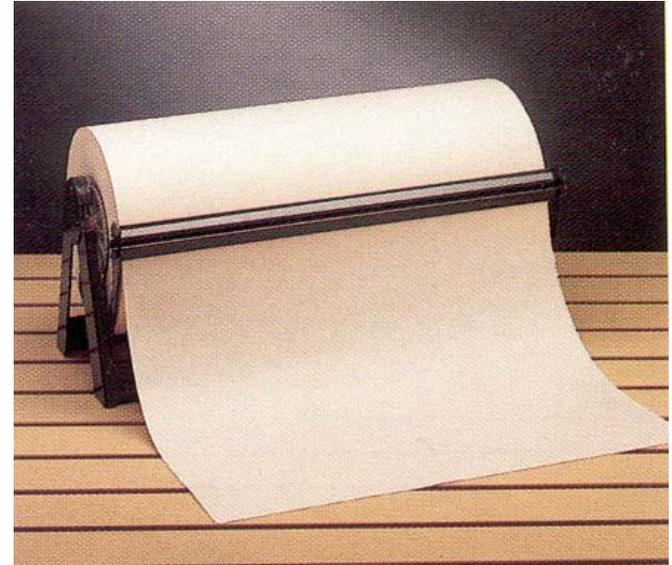
*Available packaging options*



# Questions to Ask Processors

## Butcher Paper

- First modern meat wrapping material
  - Waxes to prevent liquid from leaking through
  - Cheap because not very high quality and not cut
- Not an air-tight wrapping
  - Freezer burn



# Questions to Ask Processors

## PVC Overwrap

- Clear
- Clingy (Saran Wrap)
- Can be sealed
- Can be used in hot-fill operations
- Allows oxygen transport
- Good barrier against water transport
- Usually not form fitting





# Questions to Ask Processors

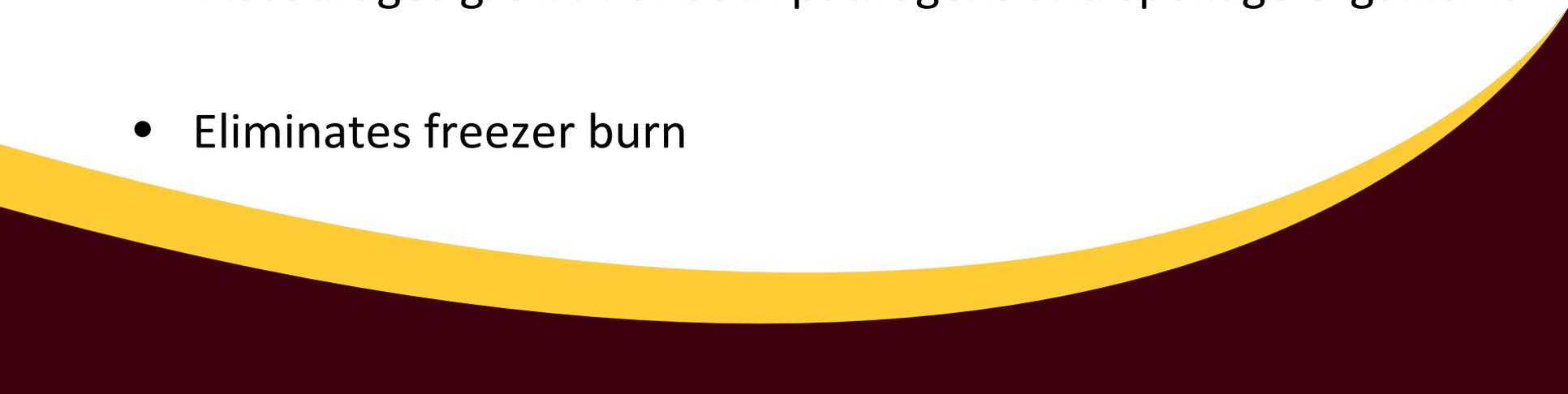
## Modified Atmosphere Packaging

- Vacuum Packaging
  - Gas Flush Packaging
    - Negative Pressure
    - Batch Replacement
- 



# Questions to Ask Processors

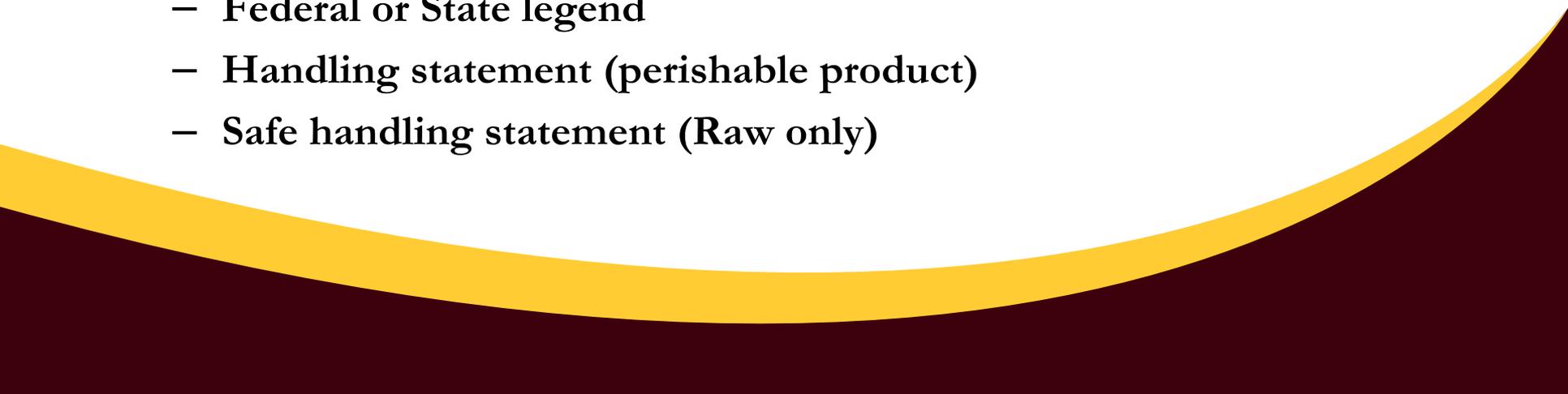
## Vacuum Packaging

- Can remove more than 99% of oxygen
  - Keep color in deoxymyoglobin state
  - Discourages growth of both pathogens and spoilage organisms
  - Eliminates freezer burn
- 



# Questions to Ask Processors

## Product Labeling

- **General requirements**
    - Company name and address
    - Ingredient list
    - Net weight
    - Common product name
    - Federal or State legend
    - Handling statement (perishable product)
    - Safe handling statement (Raw only)
- 

# Label Features





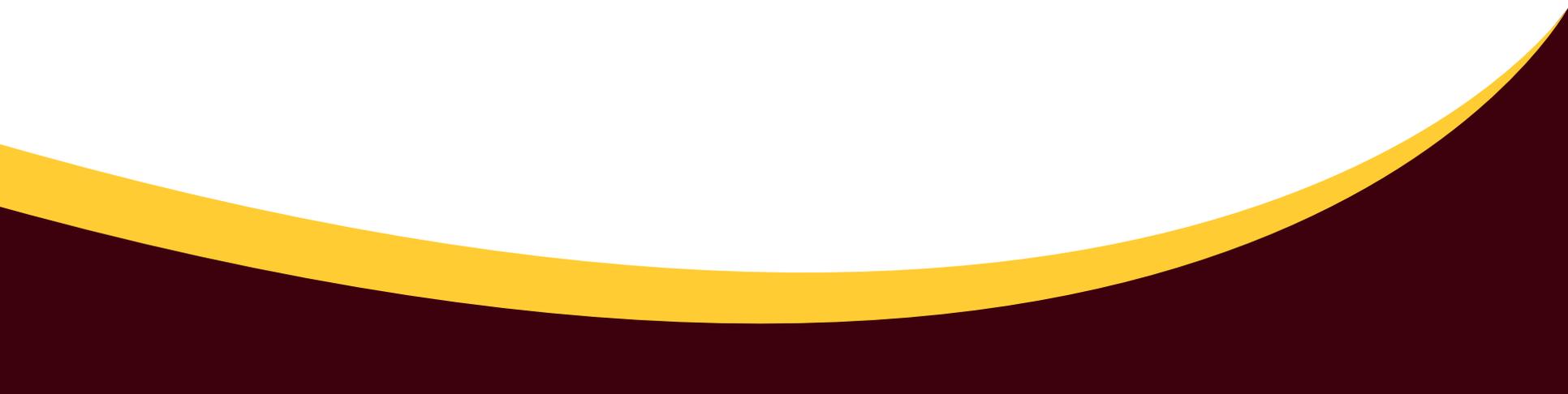
# Common Pitfalls

- Identify your market early and ensure proper demand
  - Can you supply a consistent supply of your product in a sufficient volume to meet your processor/customer demand?
  - Start small, then increase volume as needed
  - **BE REALISTIC AND PATIENT!**
- 



# Common Pitfalls

**“All of these processors aren’t doing it right, I will just open a processing plant of my own!”**





# Common Pitfalls

- Understand the yields on your product
  - Pork Dressing Percentage: 72%
  - Beef Dressing Percentage: 62%
  - Lamb Dressing Percentage: 52%
- Cannot sell much bone or excess fat
- Fabrication (Cut-Out) percentage around half
  - Pork ~ 55%
  - Beef 46-55%

# Common Pitfalls



## Example

1,200 lb. steer

Dressing percentage of 62% yields a 744 lb. hot carcass

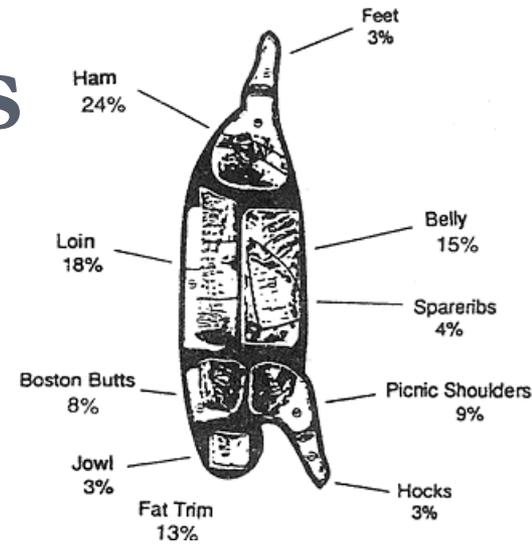
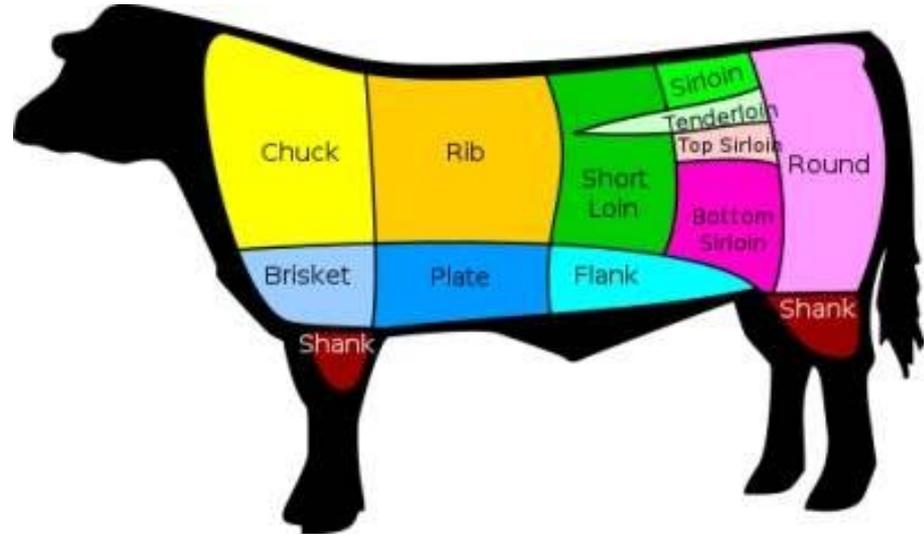
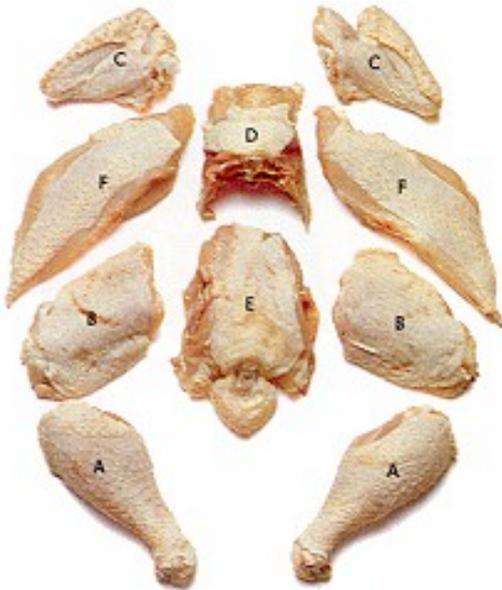
Dry aging 10-14 days (5% loss) yields a 706.8 lb. cold carcass

Yield Grade 3 Carcass (average) will yield approximately 50% boneless closely trimmed retail cuts = 353.4 lb. Beef

30%

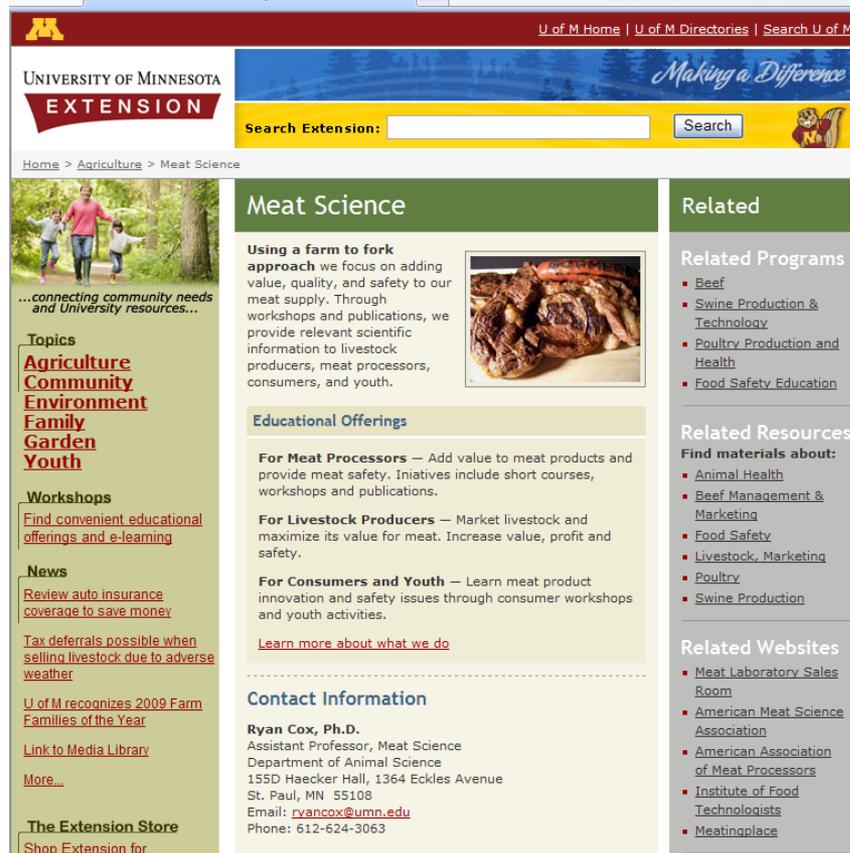
# Common Pitfalls

- Not all cuts are created equal
  - Do you have a market for all cuts?



# Resources Available

[www.extension.umn.edu/meatscience](http://www.extension.umn.edu/meatscience)



The screenshot shows the University of Minnesota Extension website. At the top, there is a navigation bar with the University of Minnesota logo and the text "U of M Home | U of M Directories | Search U of M". Below this is a blue banner with the slogan "Making a Difference" and a search bar labeled "Search Extension:". The main content area is divided into three columns. The left column features a photo of a family walking on a path, with the text "...connecting community needs and University resources...". Below this are sections for "Topics" (Agriculture, Community, Environment, Family, Garden, Youth), "Workshops" (Find convenient educational offerings and e-learning), "News" (Review auto insurance coverage to save money, Tax deferrals possible when selling livestock due to adverse weather, U of M recognizes 2009 Farm Families of the Year, Link to Media Library, More...), and "The Extension Store" (Shop Extension for). The middle column is titled "Meat Science" and contains the text "Using a farm to fork approach we focus on adding value, quality, and safety to our meat supply. Through workshops and publications, we provide relevant scientific information to livestock producers, meat processors, consumers, and youth." Below this is a photo of a cooked meat product and a section titled "Educational Offerings" with three sub-sections: "For Meat Processors", "For Livestock Producers", and "For Consumers and Youth". A link "Learn more about what we do" is provided. The right column is titled "Related" and contains sections for "Related Programs" (Beef, Swine Production & Technology, Poultry Production and Health, Food Safety Education), "Related Resources" (Find materials about: Animal Health, Beef Management & Marketing, Food Safety, Livestock, Marketing, Poultry, Swine Production), and "Related Websites" (Meat Laboratory Sales Room, American Meat Science Association, American Association of Meat Processors, Institute of Food Technologists, Meetingplace).

U of M Home | U of M Directories | Search U of M

UNIVERSITY OF MINNESOTA  
EXTENSION

Search Extension:  Search

Home > Agriculture > Meat Science

## Meat Science

Using a farm to fork approach we focus on adding value, quality, and safety to our meat supply. Through workshops and publications, we provide relevant scientific information to livestock producers, meat processors, consumers, and youth.



### Educational Offerings

**For Meat Processors** — Add value to meat products and provide meat safety. Initiatives include short courses, workshops and publications.

**For Livestock Producers** — Market livestock and maximize its value for meat. Increase value, profit and safety.

**For Consumers and Youth** — Learn meat product innovation and safety issues through consumer workshops and youth activities.

[Learn more about what we do](#)

### Contact Information

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Phone: 612-624-3063

## Related

### Related Programs

- Beef
- Swine Production & Technology
- Poultry Production and Health
- Food Safety Education

### Related Resources

Find materials about:

- Animal Health
- Beef Management & Marketing
- Food Safety
- Livestock, Marketing
- Poultry
- Swine Production

### Related Websites

- Meat Laboratory Sales Room
- American Meat Science Association
- American Association of Meat Processors
- Institute of Food Technologists
- Meetingplace

...connecting community needs and University resources...

#### Topics

- Agriculture
- Community
- Environment
- Family
- Garden
- Youth

#### Workshops

[Find convenient educational offerings and e-learning](#)

#### News

- [Review auto insurance coverage to save money](#)
- [Tax deferrals possible when selling livestock due to adverse weather](#)
- [U of M recognizes 2009 Farm Families of the Year](#)
- [Link to Media Library](#)
- [More...](#)

#### The Extension Store

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# Resources Available

## www.ansci.umn.edu/meatlab

 UNIVERSITY OF MINNESOTA [One Stop](#) | [Directories](#) | [Search U of M](#) | [Maps](#)

## DEPARTMENT OF ANIMAL SCIENCE

What's inside

[Home](#) > [Meat Laboratory Sales Room](#)

### Meat Laboratory Sales Room

<p><b>DEPARTMENT</b> <a href="#">Administrative Reports</a> <a href="#">History</a> <a href="#">Judging Teams</a> <a href="#">Newsletters</a></p> <p><b>RESEARCH</b> <a href="#">Animal Gene Mapping Tools</a> <a href="#">Biodiesel Feeds</a> <a href="#">Distillers Grains (DDGS)</a> <a href="#">Physiology &amp; Growth Biology</a> <a href="#">Research by Species</a></p> <p><b>EDUCATION</b> <a href="#">Prospective Students</a> <a href="#">Graduate Program</a> <a href="#">Undergraduate Program</a> <a href="#">VetFAST Program</a> <a href="#">More information...</a></p> <p><b>EXTENSION/OUTREACH</b> <a href="#">Resources by Specie</a> <a href="#">U of M Extension Websites</a> <a href="#">Youth Programs</a> <a href="#">Animal Facility Tours</a> <a href="#">MN Nutrition Conference</a> <a href="#">W.E. Petersen Symposium</a></p> <hr/> <p><b>Contact Us</b> Department of Animal Science University of Minnesota 305 Haecker Hall 1364 Eckles Avenue St. Paul, MN 55108-6118  Phone: 612-624-2722 Fax: 612-625-5789</p>	<p><b>Location:</b> <b>Andrew Boss Laboratory/Meat Science</b> Room 26 (Lower Level) 1354 Eckles Avenue St. Paul, MN 55108 <a href="#">Map</a></p> <p><b>Sales Hours:</b> <b>2:00-5:00 p.m. Wednesdays</b> <i>Contact us about additional days/hours.</i></p> <p><b>Contacts:</b> Pete Nelson, Meat Lab Supervisor Tel: (612) 624-9260 Email: <a href="mailto:nels5618@umn.edu">nels5618@umn.edu</a></p> <p><b>How to Order:</b> <b>Order by <a href="#">Email</a></b> <i>- confirmation will be sent within 12 hours - send us your email address and we'll notify you of upcoming specials</i></p> <p><b>Stop In or Call Us</b> <i>Any requests? Just ask!</i></p>	<p><b>Meat Sales:</b></p> <p><a href="#">Beef</a></p> <p><a href="#">Pork</a></p> <p><a href="#">Sausage</a> - made right here at the U of M!</p> <p><a href="#">Lamb</a> - raised at West Central ROC at Morris!</p> <p><a href="#">Poultry Meat</a></p> <p><a href="#">Recipes</a></p> <p><a href="#">Product List</a> - printer friendly version (pdf)</p>
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Done

# Resources Available

[www.auri.org](http://www.auri.org)



**Agricultural Utilization Research Institute**

<a href="#">Home</a>	<a href="#">About AURI</a>	<a href="#">News</a>	<a href="#">Research</a>	<a href="#">Search</a>
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### » Welcome to AURI

AURI is a unique and dynamic research institute that works to develop and implement innovative new uses for agricultural commodities. Value added agriculture is what we are all about.

AURI provides scientific technical assistance, technology transfer and a targeted network of resources to develop value-added uses for crops and coproducts. We provide **applied research services and product development assistance** to create new ag-based products and help move them to market. With unique facilities and a highly-functioning, professional **staff**, AURI is a one-of-a-kind resource that provides assistance to Minnesota businesses looking to create more value for the state's agricultural products.

If you have an idea or need assistance in the development of agriculturally-based product, we invite you to contact us by phone (507-835-8990) or **email** to see **how we can help you**.

### » AURI Research

Research is a vital part of AURI—it says so right in our name. We work with businesses, entrepreneurs and cooperatives to help develop new products and processes that create new uses for Minnesota ag commodities. Through applied research and technology transfer, AURI helps to bring new concepts forward.

#### » Our Latest Research

- » [Crop Residue Valuation Template](#) [Co-Product Utilization]  
As interest grows in biomass to energy and other value added opportunities for Agricultural residues, AURI focused on the need to develop a useful tool to help individuals determine an accurate fertilizer replacement value for crop residue removal. The Crop Residue Valuation Template tool allow... (10-12-2010)
- » [Use of Glycerol as a Corn Replacement in Calf Starter Diets](#) [Co-

### » Around AURI

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» [Ag Innovation News 2010](#)  
2010 | Vol 19 | No. 4



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## www.mda.state.mn.us



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of AGRICULTURE

MDA A-Z index | MDA staff directory | Visitor parking | HELP

Welcome to the Minnesota Department of Agriculture

Economic forces are squeezing many pork and dairy producers this summer. While each family's situation is unique, there are many resources available to help producers and their families.

**Related links**  
[Resources for Producers in Crisis](#)

**Site Directory**

- All About the Minnesota Dept. of Agriculture (MDA)
- Animals & Livestock
- Ag Chemicals & Fertilizers
- Food From Farm to Table
- Grants, Loans & Financing
- Licensing, Inspections, Certifications & Testing
- News, Media, Events & Publications
- Plants, Pests & Pest Control
- Protecting Our Lands & Waters
- Renewable Energy
- For Kids

**Latest news**

- [Introducing Cold Hardy Kiwifruit to Minnesota](#)  
July 30
- [Ag Commissioner issues statewide "Eat Local Challenge"](#)  
July 30
- [Sunflower growers to conduct public hearing on upcoming referendum](#)  
July 29
- [On-farm field day to demonstrate methods of overwintering blueberries](#)  
July 27

[>> MDA News](#)

**Do it online**

- [Apply / Renew a License](#)
- [Search Minnesota Grown](#)
- [Register a Food Safety Complaint](#)
- [Conservation Funding Guide](#)

[>>MORE Do it online](#)

**In the spotlight**

- [Eat Local Challenge](#)
- [Do I have emerald ash borer? Use this checklist to find out \(PDF\)](#)
- [Pesticide Misuse Complaints](#)
- [Weekly Crop Progress Report](#)

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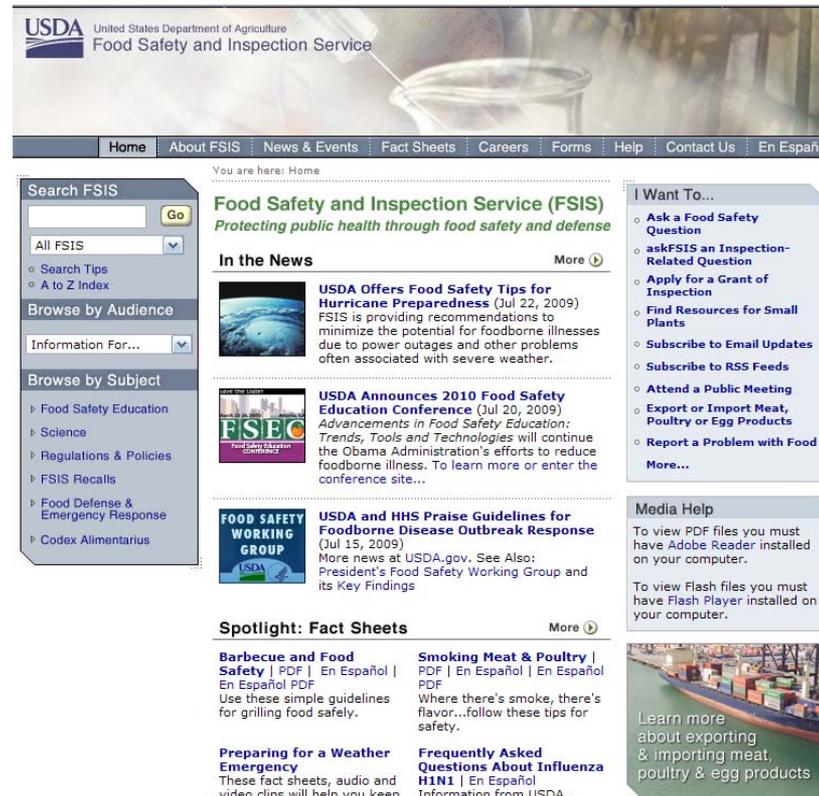
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# Resources Available

## www.fsis.usda.gov



The screenshot shows the USDA Food Safety and Inspection Service (FSIS) website. At the top left is the USDA logo and the text "United States Department of Agriculture Food Safety and Inspection Service". Below this is a navigation menu with links for Home, About FSIS, News & Events, Fact Sheets, Careers, Forms, Help, Contact Us, and En Español. A breadcrumb trail indicates "You are here: Home".

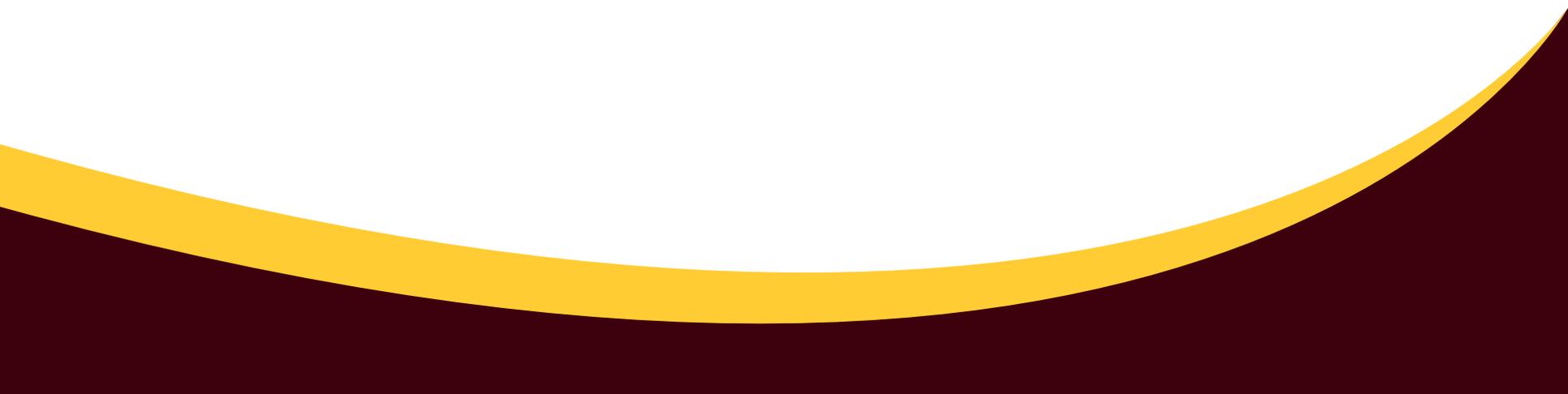
The main content area is divided into several sections:

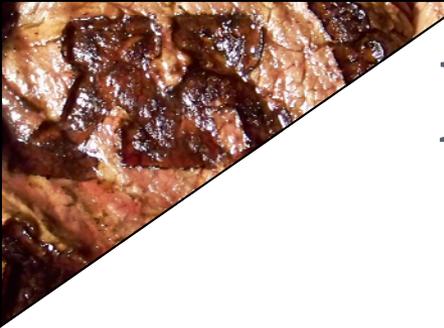
- Search FSIS:** Includes a search box with a "Go" button, a dropdown menu for "All FSIS", and links for "Search Tips" and "A to Z Index".
- Browse by Audience:** A dropdown menu labeled "Information For...".
- Browse by Subject:** A list of categories with expandable arrows: Food Safety Education, Science, Regulations & Policies, FSIS Recalls, Food Defense & Emergency Response, and Codex Alimentarius.
- Food Safety and Inspection Service (FSIS):** A header section with the tagline "Protecting public health through food safety and defense".
- In the News:** A section with a "More" link and three news items:
  - USDA Offers Food Safety Tips for Hurricane Preparedness (Jul 22, 2009):** FSIS is providing recommendations to minimize the potential for foodborne illnesses due to power outages and other problems often associated with severe weather.
  - USDA Announces 2010 Food Safety Education Conference (Jul 20, 2009):** Advancements in Food Safety Education: Trends, Tools and Technologies will continue the Obama Administration's efforts to reduce foodborne illness. To learn more or enter the conference site...
  - USDA and HHS Praise Guidelines for Foodborne Disease Outbreak Response (Jul 15, 2009):** More news at USDA.gov. See Also: President's Food Safety Working Group and its Key Findings.
- Spotlight: Fact Sheets:** A section with a "More" link and three fact sheet items:
  - Barbecue and Food Safety:** PDF | En Español | En Español PDF. Use these simple guidelines for grilling food safely.
  - Smoking Meat & Poultry:** PDF | En Español | En Español PDF. Where there's smoke, there's flavor...follow these tips for safety.
  - Preparing for a Weather Emergency:** These fact sheets, audio and video clips will help you keep food safe during a power failure.
  - Frequently Asked Questions About Influenza H1N1:** En Español. Information from USDA.
- I Want To...:** A list of links: Ask a Food Safety Question, askFSIS an Inspection-Related Question, Apply for a Grant of Inspection, Find Resources for Small Plants, Subscribe to Email Updates, Subscribe to RSS Feeds, Attend a Public Meeting, Export or Import Meat, Poultry or Egg Products, Report a Problem with Food, and More...
- Media Help:** Two paragraphs explaining how to view PDF files (requires Adobe Reader) and Flash files (requires Flash Player).
- Learn more about exporting & importing meat, poultry & egg products:** A small image of a cargo ship.



# Resources Available

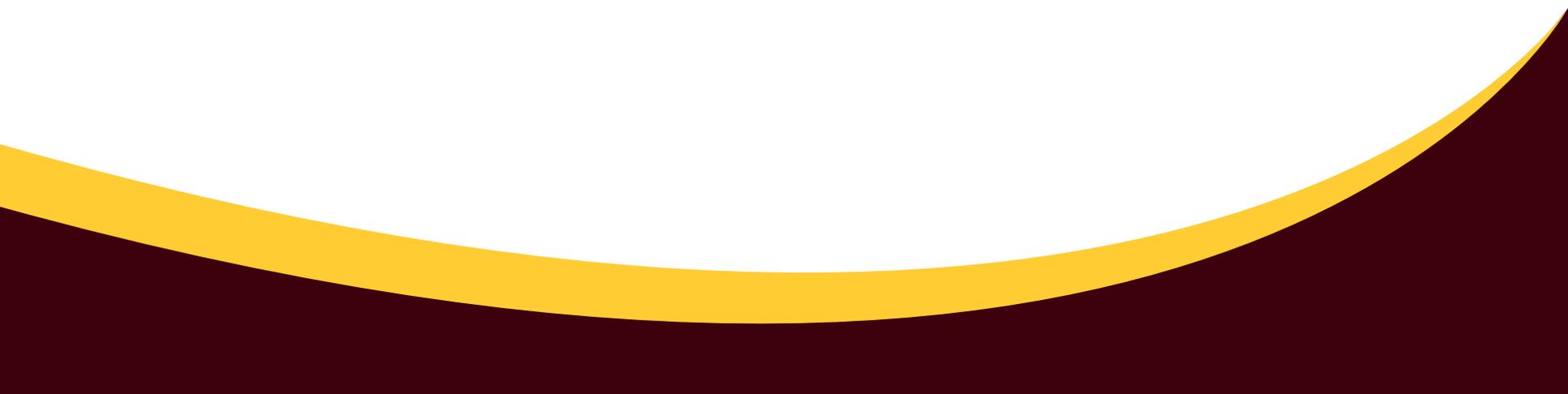
[www.mamponline.com](http://www.mamponline.com)





# Resources Available

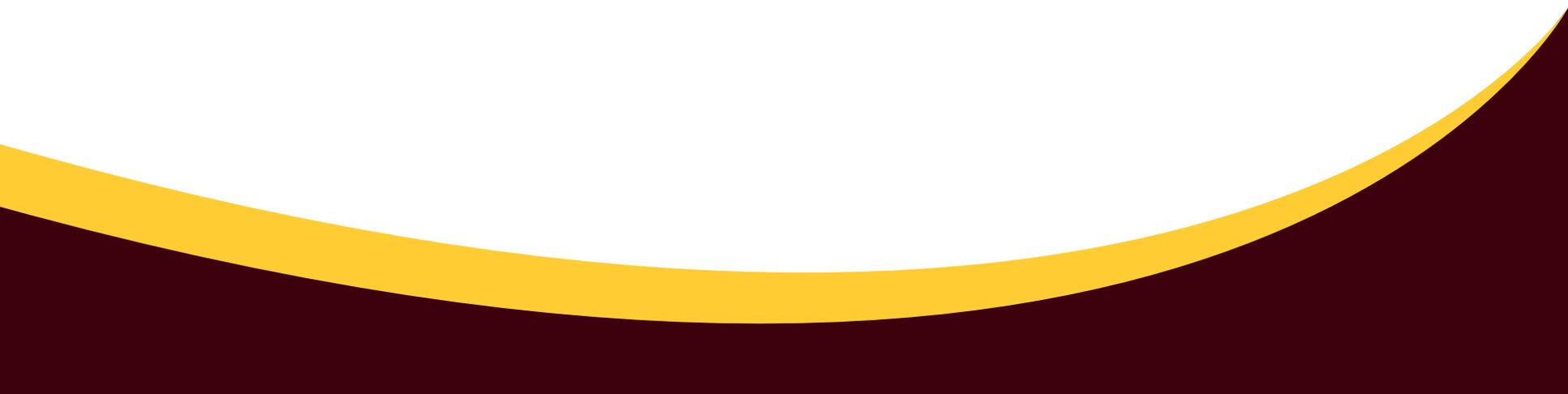
[www.aamp.com](http://www.aamp.com)





# Resources Available

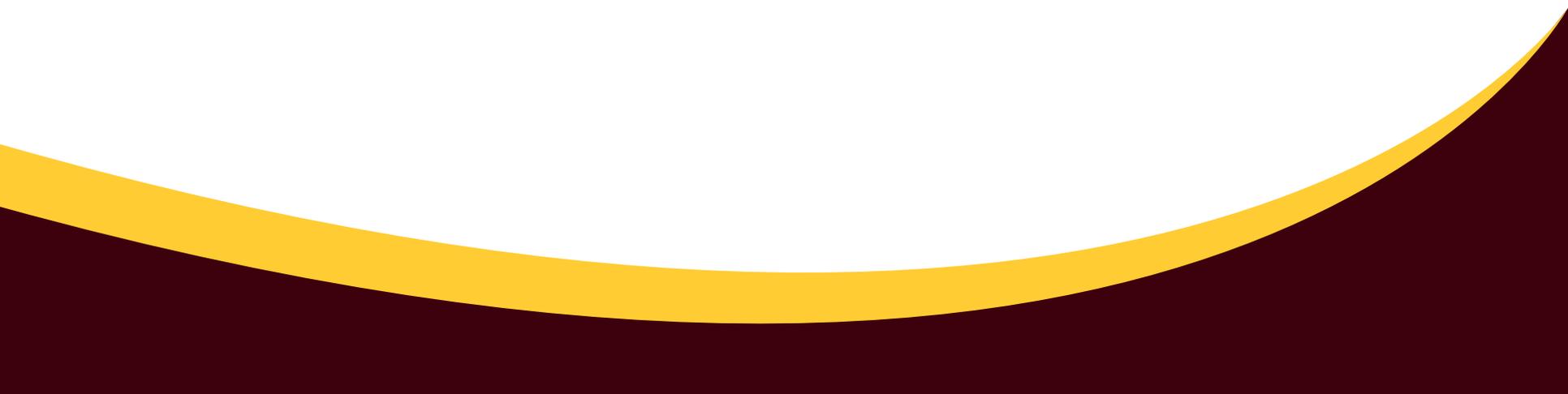
[www.nichemeatprocessing.org](http://www.nichemeatprocessing.org)





# Resources Available

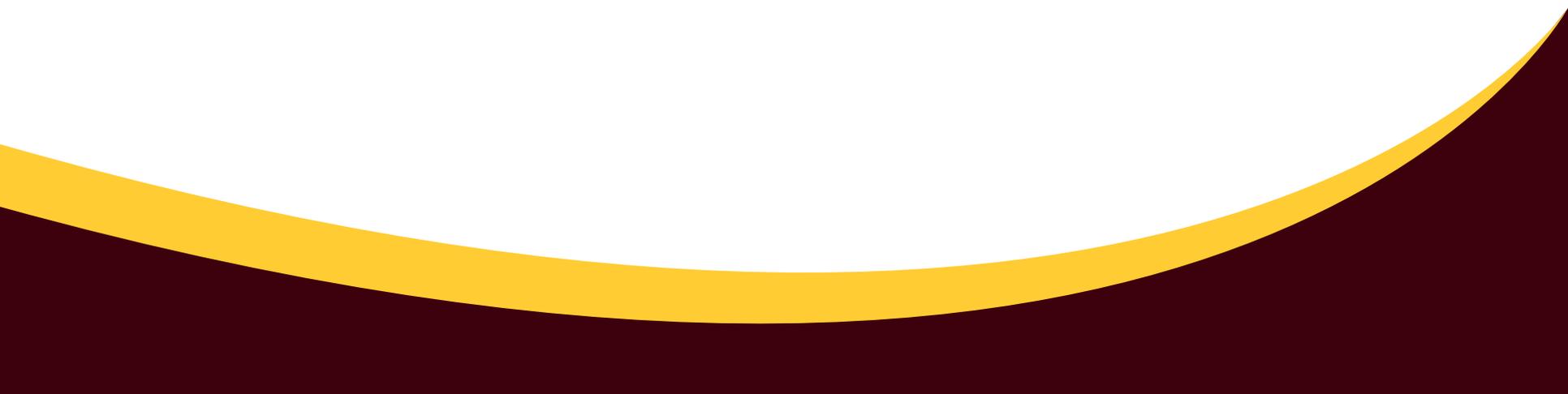
[www.minnesotagrown.com](http://www.minnesotagrown.com)





# Resources Available

Find University of Minnesota Meat  
Science on Facebook!



# Thank You



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