



Meat Messenger

North Dakota State Meat and Poultry Inspection Program

2023 Issue 2

A Message from the State Veterinarian

Greetings,

The world's food supply relies on animal health. The work of the producers, veterinarians, and state and federal staff allows our consumers to be confident their animal agricultural products are safe for sale and consumption around the globe. The North Dakota Department of Agriculture's Animal Health Division works to protect the health of domestic animals and non-traditional livestock, and administers all rules and orders of the State Board of Animal Health.

This current spring and summer's weather events and soil conditions in North Dakota are conducive to anthrax breaks. To date, there have been 24 cases. Grant, Hettinger and Adams counties are affected. Nine veterinarians, from several veterinary clinics, have been directly involved in the response to their producers. These herds are quarantined until they have met criteria for movement and sale. These producers are doing a great job of managing the breaks and are working quickly to get their quarantines lifted. I commend these communities for responding to the needs of their neighbors.

Once anthrax was diagnosed in Minnesota in mid-summer, the Department of Agriculture and Animal Health Division sent out notice encouraging livestock owners to reach out to their veterinarians to discuss options for diagnosis, treatment and/or vaccination of their herd, especially in areas with a history of anthrax. Once identified in North Dakota, further outreach was provided to our veterinarians and producers.

Livestock owners were encouraged to closely monitor their herds and report unexplained deaths to their veterinarians. Veterinarians collected samples and the NDSU Veterinary Diagnostic Laboratory provided quick confirmation of diagnosis for these herd infections. Early detection and immediate response with treatment and vaccination has diminished the impacts of the disease.

We will continue to work with veterinarians and livestock producers to ensure healthy herds in North Dakota. While we are not having additional cases reported, the conditions continue to be favorable for additional breaks in unvaccinated animals.

Sincerely,

Dr. Ethan Andress

State Veterinarian and Animal Health Division Director



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Labeling Corner

Safe Handling Instructions: Required on meats that are NOT ready to eat. (9cfr317.2(I)).

Meat products that are fully cooked or ready-to-eat products should not bear the safe handling instructions, since it is misleading to have a statement that the food is raw and should be cooked thoroughly. The products are already cooked or ready to eat and they only require heating for palatability, not for safety.

Special Handling Instructions: Not the same as the safe handling instructions. (9 CFR 317.2(k))



The special handling instructions are required for all products that require specific handling requirements to maintain wholesomeness, such as “Keep Refrigerated” or “Keep Frozen.”

All meat products will require special handling instructions, unless the process has specific support that the product is shelf-stable and does not require refrigeration, like water activity testing or pH testing.

Safe Handling Instructions

This product was prepared from inspected and passed meat and/or poultry. Some food products may contain bacteria that could cause illness if the product is mishandled or cooked improperly. For your protection, follow these safe handling instructions.



Keep refrigerated or frozen.
Thaw in refrigerator or microwave.



Keep raw meat and poultry separate from other foods.
Wash working surfaces (including cutting boards), utensils, and hands after touching raw meat or poultry.



Cook thoroughly.



Keep hot foods hot. Refrigerate leftovers immediately or discard.

Dog Treats: How to Utilize More Product

Many dog owners love to treat their four-legged family members. One special treat is a smoked beef bone. Can your meat shop smoke bones and sell them for profit, rather than throw them out? Simple products made from traditionally inedible animal tissues can be sold as pet treats.

Per ND Century Code 4.1-41-05, pet foods need to be registered, but the North Dakota Department of Agriculture considers pet treats exempt from registration.

Chews and bones, whether flavor-coated or unflavored, are exempt from registration, unless a claim is made that the product provides value to the animal (i.e. “Good for Digestion,” “High Protein” or “Cleans dog teeth”). The raw ingredients must be sourced from previously USDA or state inspected and passed carcasses. Some examples of products exempt from registration are:



- All chews, bones, toys and exercisers made of animal skins or hide
- Hooves
- Ears
- Animal bones
- Ligaments
- Snouts
- Pizzles

The North Dakota Department of Health and Human Services Food and Lodging Division requires that the products are labeled “Not for Human Consumption” or equivalent and must be kept separated from other human foods, such as on separate shelves or in separate coolers. If you are using equipment in your facility for processing, smoking, injecting etc., pet treats need to be separate from your human food processing. Example: Pet treats are done at the end of the day or the equipment is washed before human food is processed through that equipment.

Custom exempt meat plant operators are required to properly dispose of all the denatured inedible tissues resulting from the slaughter and processing services of another person’s animal under the custom exemption requirements. Therefore, only the bones and hides of animals slaughtered under official inspection of the state or USDA are eligible for processing into animal treats, which would include bones from box meat processed for retail sales.

For more information on pet food or pet treat manufacturing, contact Jamie Good, the North Dakota Department of Agriculture Feed Specialist at 701-226-7337.

Biofilms

Biofilms are groups of microorganisms clumped to themselves. A matrix of polysaccharides hold together many types of microorganisms which become resistant to removal. A mature biofilm usually contains a symbiotic relationship of many types of bacteria, yeasts and molds that have the ability to create complex water channels to carry dissolved oxygen and nutrients through the bio-community. Protein and fats that adhere to equipment may allow for a biofilm to develop very quickly; within 10 days it can grow in structural strength and become extremely difficult to penetrate and remove. Once established, the cement-like substance used to hold the biofilms together also make it resistant to most detergents and sanitizers.



Cracks, pits, folds and non-self-draining equipment can harbor biofilms. Even the surface of stainless steel that is not sanitized may have a surface finish rough enough to harbor biofilms, even when the surfaces appear clean. As food products pass over these biofilms, the vibration and friction causes some microorganisms to slough off onto the food, leading to higher levels of spoilage incidents and shortened shelf life of the product. In addition, pathogens may be present in the biofilms, which may cause some products to become adulterated. One of the most concerning pathogens is *Listeria Monocytogenes*, which causes extreme illness and has one of the highest mortality rates for bacteria-caused foodborne illnesses.

Sanitation is the best prevention. Always scrub vigorously with commercial detergents, such as a chlorinated alkaline cleaner, especially where two pieces of equipment interface with each other. Apply a properly mixed sanitizer to all surfaces. Carefully visually inspect all surfaces for cleanliness, pits, and cracks, replacing or repairing equipment as often as necessary. The use of bright flashlights is highly encouraged since it will highlight very difficult-to-see surface soils or cracks in equipment.

Heiman, Rick. (3-A SSI). *Dairy Plant Biofilms and Their Controls* Accessed April 19, 2023. Retrieved from <https://www.3-a.org/newsletter-article/dairy-plant-biofilms-and-their-control>

Carcass Chilling

Many biochemical processes and structural changes occur during the first 24 hours postmortem, playing a great role in ultimate quality and palatability of meat. “Cold-shortening” is a toughening of the meat, caused when the carcass is chilled too quickly, slowing down the activity of rigor mortis.

The best practices for industry suggest that the surface temperature of the beef rounds should be less than 40F at about 24hours, which is slowly enough to ensure that the deep muscle temperature does not drop below 50F prior to the meat pH reaching 6.2, but quickly enough to prevent excessive spoilage organism growth. After rigor mortis subsides, the muscles will relax and desirable tenderness can be achieved.

Pork contains an abundance of white muscle fibers, which has more glycogen, allowing for a fast pH drop, so rigor mortis sets in and subsides more quickly in swine carcasses. That leads to another issue. Pork not chilled quickly enough, often develops the undesirable condition of pale, soft and exudative (PSE) pork. The recommendation for pork carcasses is getting the internal meat temperature down to 50F within 12 hours and then under 40F at 24 hours after slaughter.

(continued on next page)

Carcass Chilling (continued)

Improper chilling of beef and pork increases the incidence of bone sour or bone taint, a putrid 'sewage-like' odor and deterioration of meat around the joints caused by anaerobic bacterial contamination of synovial fluids. Bone sour is often not detected until processing and requires extensive trimming.

In 1965, Donald Miller filed to patent a device that injects liquid carbon dioxide into joint cavities (knuckles and ball sockets), forcing the synovial fluid to leak out prior to carcass washing, reducing the bacterial accumulation in the joint and limiting bone sour. However, this device never caught on as refrigeration and carcass hygiene has improved.

Savell JW, Mueller SL, Baird BE. The chilling of carcasses. *Meat Sci.* 2005 Jul;70(3):449-59. doi: 10.1016/j.meatsci.2004.06.027. Epub 2005 Feb 25. PMID: 22063744.

Miller, Donald. (1970), *Method of Purging a Socket Cavity of a Meat Animal Carcass*, Patent #3,498,797, United States Patent Office, <https://patentimages.storage.googleapis.com/f8/81/61/646326cde0ef57/US3498797.pdf>

Klauer, Brenna L. (2019) *Mapping Temperature Decline in Beef Cattle During Conventional Chilling (Master's Thesis)*. Colorado State University, Fort Collins Colorado. Retrieved from <https://api.mountainscholar.org/server/api/core/bitstreams/c3179688-1897-4339-8bd3-1da34ed9b0f5/content>

Shiga-Toxin Producing Escherichia coli (STECs)

Almost everyone knows E.coli O157:H7 as the primary pathogen of concern in beef, but the shiga toxin-producing Escherichia coli (STEC) are a diverse group, implicated in over 270,000 cases of human illness annually in the US alone. More than 200 serotypes have been known to produce shiga toxins (stx), but the production of stx is not solely responsible for disease.

Some E. coli O157:H7 have found to be acid resistant, meaning they mutated to survive low pH conditions. The survival rate is even higher when people take antacids, which raises the pH of the stomach. Once past the stomach, most pathogenic E.coli adapted the ability to attach to the intestinal surface and then destroy the membranes, known as the "attaching and effacing" (a/e) characteristic. The resulting lesions can cause bloody diarrhea.

Several studies suggest that E.coli O157:H7 may have descended from the non-toxigenic and less virulent strain E.coli O55:H7, but adapted with the ability to produce stx. The stx are effective against small blood vessels, often specially targeting the glomerulus, a network of small blood vessels in the kidney, which is responsible for filtering the blood, causing hemolytic uremic syndrome, a type of kidney failure.

Humans have specific receptors in the body that are susceptible to stx attachment, allowing the toxin to enter the cells. Cattle, swine and deer do not have these receptors, so they may harbor toxigenic e.coli without suffering the ill effects of the stx.

Lim JY, Yoon J, Hovde CJ. A brief overview of Escherichia coli O157:H7 and its plasmid O157. *J Microbiol Biotechnol.* 2010 Jan;20(1):5-14. PMID: 20134227; PMCID: PMC3645889.

Wikipedia contributors. (2023, May 3). Cytotoxicity. In Wikipedia, The Free Encyclopedia. Retrieved 16:01, July 20, 2023, from <https://en.wikipedia.org/w/index.php?title=Cytotoxicity&oldid=1153018562>

Chew the Fat: Rendering Fat in Your Facility



Animal fats fell out of popularity with the rise of seed oils, which are cheaper to process. The most popular fast food chain originally used tallow for their famous fries, but converted to vegetable fry oil in 1990. Recently, rendered animal fats have been having a bit of resurgence in the U.S. diet and use for topical skin care regimens. The scientific community does not have a consensus on the health properties of animal fats, as some studies contradict the decades-old idea that fat caused weight gain and other health concerns. In fact, pork fat is listed as #8 on the BBC's list of the world's most nutritious foods.

Tallow is the rendered fat of beef or mutton, and was traditionally used to

make candles and soaps. July 13 is National Beef Tallow Day, established by the Health Fats Coalition in 2017. Lard is rendered pork fat. The most common fat rendered is the harder fat found around the loin and kidneys. Poultry fat is also quite common. Duck fat has the moniker of 'liquid gold' in the culinary world and rendered chicken or goose fat (schmaltz) is very popular in Jewish fare.

Rendered fat is a relatively easy product to produce. One of the easiest methods involves a slow-cooker or roaster:

1. Place fat into the slow-cooker or roaster pan. Grinding or dicing the fat before facilitates rendering more quickly
2. Add a small amount of water to the fat, which helps keep the fat from burning
3. Heat on low to medium for several hours until the fat is completely liquid
4. Strain the fat through a cheesecloth, to remove bits of meat and unrendered fat. A second heating cycle may be necessary to evaporate the remaining water
5. Pour or ladle the rendered fat into deli containers and refrigerate

USDA regulations state the rendered fat may not contain any added water, so always boil the water away. Tallow is not allowed to have more than 0.15% insoluble impurities.

BBC Future by Fact and Story; Available at <https://www.bbc.com/future/article/20180126-the-100-most-nutritious-foods>; retrieved July 19, 2023

Beef Tallow Day- July 13, 2023; available at <https://nationaltoday.com/beef-tallow-day/>; retrieved July 19, 2023.

2023 Recalls To Date

To date in 2023, there have been 61 recalls, but there are still 3 more months to go. Last year (2022), there were a total of 69 recalls.

Reason for the Recall or Public Health Alert in 2023	Times Cited for Reason of the Recall or Public Health Alert
Misbranding	21
Unreported Allergens *	20
Product Contamination	14
Produced Without Inspection	12
Import Violations	8
Mislabeled	3
Insanitary Conditions	2
Unfit for Human Consumption	1

*Every unreported allergen couples up with a misbranding recall, since the allergens are not correctly labeled on the package, therefore the 20 unreported allergens are also reflected in the misbranding total.

Which year had the most recalls in the last decade? There were 157 recalls in 2015.

Which year experienced the fewest recalls in the last decade? Only 50 recalls were issued in 2020.

Classified Ads

We are always looking for industry-related items to advertise in the Meat Messenger. We post sale and want ads FREE. Contact Nathan Kroh at 701-328-4767 or nkroh@nd.gov with product description and contact information.

3-Door Turbo Air Display Freezer: In working condition. Please contact Calvin or Alex for more information at 701-743-4451. Located in Parshall.

Smokehouse: Koch Grand Prize 3 - cart, jerky screens, rods and smoke generator, \$35,000. Call Dave Selensky at 701-465-3261, Selensky Meats, Drake ND.

Hobart 403 Meat Tenderizer: SN 56-937-022, blades were replaced less than a year ago, \$1,500

Bizerba A 404fb Digital Meat slicer/stacker: Slices bacon, deli meat etc., slices/shingles/stacks, SN 10563332, \$12,500.

Promax DC900 Auto Swing lid Double chamber Vac Sealer: High production machine, all functioning order, with extra wear parts included, SN P11080415, \$15,000 OBO.

Rail Trolleys: heavy-duty carcass trolleys. 100 available. \$18 each.

Call Mema's Meats at 701-453-3401, Berthold, ND.

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