



Meat Messenger

North Dakota State Meat and Poultry Inspection Program

2015 Quarter 4

Chronic Wasting Disease



Cattle, deer, sheep, racoons, mice and elk, like the one shown above, are being used in Agricultural Research Service (ARS) studies on transmissible spongiform encephalopathies. Photo by Peggy Greb

With the 2015 deer season underway, the North Dakota Game and Fish Department considers Chronic Wasting Disease (CWD) a serious threat to the wild deer population. CWD is a transmissible spongiform encephalopathy of mule deer, white-tailed deer, elk and moose. The disease is progressive and always fatal. Weight loss and behavioral changes such as listlessness, lethargy, excessive salivation, grinding teeth,

and increased drinking and urination are all signs of CWD. Thankfully, there is no evidence that CWD can be transmitted to domestic livestock.

Similar to bovine spongiform encephalopathy (mad cow disease) and scrapies in sheep, CWD is spread through prions. A prion is a misfolded protein

that also causes other similar proteins to misfold, which affects the surrounding tissues of the affected areas. The disease causes damage to the brain cells and creates a sponge-like appearance within the brain. CWD is specific to deer and elk. The exact mode of transmission is not known, but research suggests that prions can be excreted and transmitted by eating grass growing

in contaminated soil and CWD prions can be spread through saliva of deer as well. North Dakota Game and Fish (NDGF) collects and tests heads of deer so identification and control plans can be developed. No treatment or vaccine is available, so euthanizing and testing animals showing clinical signs of disease will help prevent the spread of infection. Any deer or elk that look sick, lethargic or emaciated should be reported the NDGF at 701-328-6300 immediately. Do not shoot, handle or consume any animal that appears sick. Processors should be aware that carcasses and meat from one CWD positive deer can easily contaminate the rest of the meat within that batch.

Can Humans get CWD?

Three cases of Creutzfeldt - Jakob disease, a human transmissible spongiform encephalopathy, were diagnosed in 1997. Each individual had consumed venison, but clinical and pathological studies did not find a causal link to CWD. While there is

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Dakota Territories Meat Processors Convention

The ND Meat Processors Association is hosting this year's convention April 21-23, 2016. It will be at the Best Western in Fargo, ND. Everyone is welcome to attend meat processing related seminars, network with other meat processors and have a good time. For more information, please contact the ND Meat Processors Secretary, Jami Reister at 701-269-8452.

Meat Messenger

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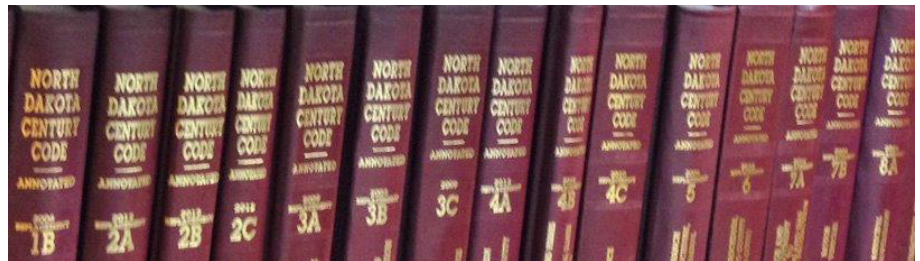
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Regulation Reminder

CHAPTER 7-13-04-01 MARKING OF PRODUCTS

7-13-04-01. Marking of products. All custom-exempt plants are required to mark all custom-exempt meat and meat food products, other than poultry, with the words “NOT FOR SALE”, stamped in block letters. The letters must be at least three-eighths of one inch [0.95 centimeter] in height. Custom slaughtered poultry must be marked with the owner’s or processor’s name and address and the statement “Exempted - P.L. 90-492.” Stamps, brands, and marks for custom-exempt meat and meat food product identification must be preapproved by the department.

History: Effective August 1, 2000; amended effective January 1, 2004.

General Authority: NDCC 36-24-04

Law Implemented: NDCC 36-24-04, 36-24-07

Chronic Wasting Disease, continued from page 1

no scientific evidence of CWD transmission through meat, the prions accumulate in the brain, spinal cord, eyes, spleen and lymph nodes. Hunters should take precautions when processing deer from areas known for CWD, which was first diagnosed in 1967 in Colorado. The first known mule deer to be diagnosed was taken in the fall of 2009 in southwestern North Dakota.



Cattle in a CWD cross-species study

“Chronic Wasting Disease FAQs.” *North Dakota Game and Fish Department*. North Dakota State Government, n.d. Web. 16 Oct. 2015. <<http://gf.nd.gov/wildlife/fish-wildlife/wildlife-diseases/chronic-wasting-disease/faq>>

“Questions & Answers on Chronic Wasting Disease for Hunters.” *Chronic Wasting Disease Alliance*. Chronic Wasting Disease Alliance, May 2015. Web. 16 Oct. 2015. <<http://www.cwd-info.org/pdf/CWD%20Brochure.pdf>>

“Prion.” *Wikipedia*. Wikipedia, Oct. 2015. Web. 12 Oct. 2015. <<https://en.wikipedia.org/wiki/Prion>>

HACCP Reassessment

9CFR 417.4(a)(3)(i)- *Reassessment of the HACCP plan.*

Every establishment shall reassess the adequacy of the HACCP plan at least annually and whenever any changes occur that could affect the hazard analysis or alter the HACCP plan.

Reassessment is simply evaluating the current HACCP plan and documenting new changes within the plan and ensuring that the plan is still adequate to control potential hazards. 9CFR 417.4 suggests changes that may warrant reassessment could be changes to raw materials or source of raw materials; product formulations; slaughter or processing methods or systems; production volume; personnel; packaging; or the intended use by consumers of the finished product.

Every HACCP plan **must** be reassessed every year, yet many plans could be reassessed several times a year. If you decide to introduce a new flavor of sausage, it is simple enough to make that under the Fully Cooked Not Shelf Stable plan without any modifications, but a real quick review of the seasoning blend might show the addition of soy. Bringing in a new seasoning blend would definitely qualify for the need to perform a two-minute reassessment. Simply review your allergen control plan, ensure that your labeling is correct and document that a new sausage flavor has been evaluated for hazards. That would conclude a reassessment.

Bringing in new equipment is one of the most overlooked changes that may warrant a HACCP reassessment. New equipment often increases efficiency, but it could still pose issues with sanitation. Any food contact surface used for ready-to-eat foods must be eligible for random *Listeria spp*s, which would be included within the HACCP Plan's *Lm* control pre-requisite program.

Keep in mind, that any time a corrective action is necessary, a HACCP reassessment may be the most prudent thing to do. The plant is responsible for making corrective actions that prevent a deviation from a CCP from re-occurring and that would be the best time to reassess your HACCP plan, identify why the original CCP deviation occurred and make simple changes. Small, easily implemented changes count toward HACCP reassessment. More than likely, you probably have had several reasons to reassess your HACCP plans this year.

USDA and Alvin & the Chipmunks Team Up to Reduce Foodborne Illness

by USDA FSIS Food Safety Education Staff Christopher Bernstein

In an effort to educate children and their families about the importance of food safety, U.S. Department of Agriculture (USDA) and the Ad Council are joining 20th Century FOX to launch a series of public service advertisements (PSAs) featuring Alvin and the Chipmunks. The PSAs use footage from the upcoming film *Alvin & the Chipmunks: The Road Chip* to introduce viewers to four steps to food safety: clean, separate, cook and chill.

The partnership includes TV, radio, out-of-home and web advertising. Parents and children can also find kid-friendly activities that further reinforce the food safety steps by visiting [FoodSafety.gov](http://www.foodsafety.gov).

The new PSAs are an extension of USDA and Ad Council's *Food Safe Families* campaign, which aims to raise awareness about the risk of foodborne illness and encourage families to learn and practice key steps that will help everyone stay safe from foodborne illness through the following safe food handling behaviors.

<http://www.foodsafety.gov/multimedia/kids/>
<http://www.youtube.com/watch?v=pvbZhEDCnY0>



Beef Shelf-Life

Shelf-life, the period from when a product is packaged to the point when the product is no longer acceptable by the user, is limited by spoilage organisms or physical characteristics that make the product undesirable. Two major factors contribute to the shelf-life of beef products - temperature and availability of oxygen. It is generally accepted that ground beef will have a shorter shelf-life than whole muscle cuts. Shelf-life is not considered the same as display life, as display life is the time product can be displayed before undesirable color changes occur, which is not indicative of spoilage, but undesirable to consumers.

Temperature control is a must for any product to delay spoilage organisms for the longest shelf-life. Vacuum packed primals can have a 35 day shelf-life under normal refrigeration temperatures and up to 80 days under optimal temperatures of (28-32°F). Frozen product below 0°F will have no bacterial growth issues, but quality generally diminishes after about 12 months.

The other major shelf-life extending variable is the presence of oxygen. Many retailers simply over-wrap foam trays filled with meat with a cling film for display. The permeability of this type of film allows for a short term bright red color (called bloom), but the shelf life is only 3-7 days.

Some packaging methods

control bacteria with the presence of carbon dioxide. Modified atmosphere packaging (MAP) can be high oxygen or low oxygen. The high oxygen packaging replaces the natural gasses in the package with filtered mixture of 80% oxygen and 20% carbon dioxide. This level of oxygen allows for the full extended bloom, and the high carbon dioxide level controls spoilage organisms. High oxygen packaging can expect 10-16 shelf days. Low oxygen packaging (70% nitrogen and 30% carbon dioxide) is used for prolonged shelf life. Nitrogen does not react with meat and displaces oxygen; the carbon dioxide prevents spoilage organism growth. Without oxygen, this type of packaging prevents blooming, leaving the meat a dark-purple color. Most consumers are not accustomed to the dark color of meat and will refrain from purchasing low-oxygen packaged products, which will actually have a considerably longer shelf-life of 25-35 days.

A potential option to create the bright red bloom color without the presence of oxygen is adding carbon monoxide to the low oxygen packaging. Myoglobin has a high affinity for carbon monoxide, so

at concentration of 0.4% carbon monoxide, the meat will be bright red bloomed color. Without free oxygen present, the color will remain bright red color longer. This practice is limited, because consumers have a negative image of carbon monoxide as a poisonous gas. The extremely low levels of carbon dioxide does not pose any hazard to consumers. This type of packaging will result in a 28-35 day shelf-life.

Peelable low oxygen packaging is often used by purveyors to extend the shelf-life of single tray products until the retail center chooses to remove the secondary film exposing the permeable film and allowing the product to bloom. This double film system allows beef to last 15-22 days and once the secondary film is peeled away, the shelf-life is similar to the permeable over-wrap trays at 3-7 days.

Creating unfavorable conditions for spoilage organisms will extend the shelf-life, but that must be balanced with consumers' expectations that meat be a bright red color.

Delmore, Robert. "Beef Shelf-Life." *Beef Facts: Product Enhancement Research*. National Cattlemen's Beef Association.,

Shelf-Life By Packaging Type					
		Whole Muscle		Ground Meat	
Packaging Type	Color	Shelf Life (days)	Display Life (days)	Shelf Life (days)	Display Life (days)
Vacuum Packaged	Purple	60-90	60-90	45-60	45-60
Air-permeable Overwrap	Red	5-7	3-7	2-3	2-3
High Oxygen	Red	12-16	3-4	10-12	3-4
Low Oxygen	Purple	25-30	2-7	25-30	2-7
Peelable Low Oxygen	Red	15-22	3-7	15-22	3-7
Low Oxygen w/ Carbon Monoxide	Red	35	35	28	28

FSIS Guideline for Labeling Mechanically Tenderized Beef Products

Six outbreaks of *E. coli* O157:H7 attributable to needle or blade tenderized beef products has led FSIS to put out guidelines for establishments to develop cooking instructions for consumers that purchase mechanically tenderized beef products. The process of driving needles or blades into the surface of meat can drive any possible bacteria into the center of that beef product. Consumers often prepare steaks “rare” or “medium-rare”, which sufficiently heats the exterior of the meat, but does not heat the interior of the meat high enough to kill off *E. coli* O157:H7. The bacteria that was pushed into the meat can cause illness, and often severe illness or death in young children and the elderly population.

To help consumers mitigate the dangers of undercooking mechanically tenderized meats, all inspected and passed mechanically tenderized meats must have cooking instructions that will provide sufficient heat to thoroughly kill *E. coli* O157:H7. To ensure consumers can easily follow the cooking instructions, the guideline suggests that cooking steps use appliances that are typically used by consumers (e.g frying pan, gas grill, broiler, oven, etc.) and have instructions that will reach a temperature that will indeed kill the dangerous bacteria. These instructions must be validated by each establishment, with evidence that when the instructions are followed, mechanically tenderized product with that label will produce a safe product.

Validating the cooking instructions is probably easier than it may seem. The establishment can

simply cook a product using peer-cooking instructions and record the results. If three separate steaks are safely cooked by following the same process; that process is now considered to have validated cooking instructions. It is important to account for variables when validating cooking instructions. Each type of product and size of product will have different cooking methods and will absorb heat differently, so each type of cut and thickness of product should have the cooking instructions validated independently of the other products. Each product should have a set of validated cooking instructions, but it is not expected that every type of cooking method will be validated and labeled on product. It is up to the establishment to choose how they would like consumers to cook their product.

New regulations will go into effect May 17, 2016. The minimum requirements for meeting the validated cooking instructions regulations must include:

- The method of cooking
- A validated minimum internal temperature that would destroy pathogens throughout the product
- A statement as to whether the product cooked in a manner described also needs to be held for a specific time at the specified temperature or higher before consumption; and
- Instructions that the internal temperature should be measured by the use of a thermometer.

It is not practical for home cooks to hold product for long periods

of time at low temperature, so it is recommended that all mechanically tenderized products are cooked a minimum temperature of 145°F and held for 3 minutes or longer. These instructions are in addition to the safe handling instructions required on raw beef.

Variables that Affect Cooking Processes

- **Type of tenderization**
 - Needle or blade
- **Thickness of product**
 - 0.5 in vs. 1.5 in
- **Type of cut**
 - Bone, fat content, shape and size
- **Method of cooking**
 - Oven, grill stovetop
- **State of product**
 - Frozen or refrigerated at time of cooking
- **Type of pan**
 - Darker pans heat faster
- **Rest or dwell time**
 - Nothing less than 3 minutes if cooked to 145° F
- **Rotation of product**
 - Flipping or turning product affects heat penetration

Curing Meats and Color Development

Potassium nitrate, also known as saltpeter, has been used for preserving and curing meats since the middle ages. Temperature control was limited, so people had to salt cure meat to preserve the harvest for as long as possible, but the impurities within the salt imparted the characteristic pink color within the meat. Little did they know that those impurities contained nitrates that flavored the meat, limited bacteria growth, prevented rancidity of fats and prevented botulism poisoning. Nitrates and nitrites can be powerful poisons. Over 90% of nitrates consumed in our diets are sourced from leafy greens, beets and celery, which contain hundreds of times more nitrates than cured meat does. A high margin of safety has been established for ingoing levels of nitrites by the USDA.

Nitrates do not cure meat. The

DID YOU KNOW | ?

Human salivary glands secrete nitrate, which could be related to a defense mechanism against oral infectious diseases.

Nitrite and nitrates break down and are converted to safe compounds. Cured meats on the grocery store shelf usually have nitrite and nitrate levels between 0.00002 and 0.004%.

curing agent is actually nitrite, which is created as a byproduct when naturally occurring bacteria on the meat react with the nitrates and create nitrite. Before refrigeration, meat was often held in the cellars, which was warm enough for the bacteria to grow and react with the potassium nitrate. If the temperature was too high, spoilage organisms would compete for the bacteria necessary for the nitrate to nitrite conversion and the meat would spoil. The level of bacteria populations, temperature control and inconsistent amounts of nitrite within the salt made the curing process difficult and very inconsistent. Nitrates are primarily used on products that will cure for several weeks under controlled conditions to allow for the lengthy conversion of nitrates to nitrites.

Today, the vast majority of commercial curing is done with sodium nitrite. Nitrites do not rely on bacterial conversion and are effective at the lower temperatures of modern walk-in coolers. Nitrites work quickly and the concentration levels are measurable, so nitrites provide the quickest, most consistent curing effect for modern meat production. About 15% of the sodium nitrite reacts with myoglobin proteins to affect the color and about 50% of the nitrite reacts with other proteins and fats to affect the flavor. Color development can occur with as little as 40 ppm, but preservative effects and flavor development occur at slighter higher levels. The USDA sets limits, because excessive cure will not get absorbed in the meat and will be eaten by the consumer directly as nitrite.

Myoglobin is a protein that carries and stores oxygen for use in the



muscle and it is responsible for the color of that muscle. Muscles of locomotion require a lot of oxygen to function, so they contain more myoglobin proteins. Heart meat and leg muscles are darker in color than loin meat, and wild game is darker than domestic animal meat, because they are used more extensively.

Meat changes color as it reacts with oxygen, going from a purple color, to red, to brown. The oxygen is freely interacting with the myoglobin. Nitrite undergoes a reaction that creates nitric oxide, which binds the heme within the myoglobin, forming nitrosomyoglobin, giving the cured meat its characteristic pink color. Cure accelerators work by increasing the speed in which nitrites are converted to nitric oxide. About 90% of nitrate and nitrite added to meat is broken down and converted to other safe compounds. It would take 6,000 to 10,000 servings of cured meat at one sitting to be considered dangerous.

Sindelar, Jeff. "What's the Deal with Nitrates and Nitrites Used in Meat Products?" University of Wisconsin Meat Science and Muscle Biology Lab, n.d. Web. 12 Oct. 2015 <http://fyi.uwex.edu/meats/files/2012/02/Nitrate-and-nitrite-in-cured-meat_10-18-2012.pdf>

Domowe, Wedliny. "Curing." Meats and Sausages, 2015. Web. 12 Oct. 2015 <<http://www.meatsandsausages.com/sausage-making/curing>>

Custom Exempt Operations: Chemical Use

Chemicals used for cleaning, pest control, maintenance and the like are probably used in every room of your meat shop. Using chemicals in accordance with the labeling is an absolute necessity. Most importantly, check to ensure that chemicals are appropriate for food processing areas and have appropriate instructions for use. Chemical supply companies specify how to use each product and whether it is appropriate for use on or near food contact surfaces.

Insect spray cans can be installed to automatically spritz out into the area, which is nice for holding pens but should not be used right next to exposed carcasses. If the can says not to use within 12 feet of food contact surfaces, you must follow the manufacturer's instructions.

Oftentimes chemicals, such as bleach, have multiple uses or several instructions for application. Bleach can be used on food contact surfaces, but it must be diluted to less than 200 parts per million. At concentrations over 200ppm, the surface will need to be rinsed with potable water prior to use. Still

some bleach companies are not labeled for food contact surface use and should not be used at all, even if rinsed. Sanitizer residues create an insanitary condition that cannot be used for food preparation.

Buying bulk cleaning supplies is economical, but care must be taken when dividing the chemical into usable bottles. Those bottles should be labeled clearly and leftover chemical should be dumped. Topping off bottles is a common mistake. Most chemicals are not shelf-stable for long periods of time and may degrade within a day. Adding new solution will only be diluted by the old solution and the concentration will be lower than expected, reducing the effectiveness. Dumping old solution will also decrease the risk of mixing incompatible chemicals if the old bottle is not labeled correctly.

All food processing establishments are responsible for sourcing and properly using only chemicals appropriate for the food processing area. The small effort to ensure proper labeling and appropriate use is imperative for anyone who wants to provide a healthful, safe product to their customers.

Easton Brown New Northeast Meat Inspector



The North Dakota Meat and Poultry Inspection Program (NDMPIP) would like to introduce Easton Brown as the newest meat inspector for the North Dakota Department of Agriculture. Easton graduated from Valley City State University with a B.S. in Wildlife and Fisheries Management. Prior to becoming the newest NDMPIP meat inspector, he worked for the Walsh County Three Rivers Soil Conservation District and has experience in a ND beef slaughter plant.

His job duties will include custom exempt facility and official establishment inspection coverage in the NE region of ND. Having worked in a slaughter plant for a couple of years, his experience is a great value to the NDMPIP. Originally from Carrington, Easton developed a great interest in trapping, hunting and horseback riding. When not on duty, he will be out checking his traps or at home tending to his chickens.

What would you like to read in the next issue?

The Meat Messenger is your newsletter. If you like the content, please feel free to share this issue with your employees, your livestock producers and customers. We welcome any questions, comments, or suggestions for future topics. Please contact **Nathan Kroh** at nkroh@nd.gov or 701-328-4767 or **Julie Nilges** at jnilges@nd.gov or 701-204-3248.

FSIS Recalls & Alerts Count July - Sept 2015

Bacterial contamination (<i>E.coli</i> , <i>Salmonella</i> , <i>Listeria</i> , <i>Staph Aureus</i> Toxin)		7
Allergens or Undeclared Protein Sources		7
Lack of Import Inspection		4
Misbranding		2
Presence of Foreign Material		2
Total Recalls in 3rd Quarter 2015		22 recalls
Class 1 recalls - 17 Reasonable probability that eating the food will cause health problems or death	Class 2 recalls - 5 Potential health hazard situation in which there is a remote probability of adverse health consequences from eating the food	Class 3 recalls - 0 Situation in which eating the food will not cause adverse health consequences
More than 5,878,371 lbs. of meat and poultry implicated in recalls		

Further information on all current recalls and alerts can be found at: <http://www.fsis.usda.gov/wps/portal/fsis/topics/recalls-and-public-health-alerts>

Classified Ads

We are always looking for industry related items to advertise in the Meat Messenger. We post sale and want ads FREE. Contact Julie Nilges (701-204-3248) at jnilges@nd.gov or Nathan Kroh (701-328-4767) at nkroh@nd.gov with product description and contact information.

True Brand cooler: Cooler has two sliding doors and was manufactured in 2001 - \$1,000;
New one-quart plastic containers with lids: \$20 per lot of 50.
 Please contact Calvin or Alex for more information at 701-743-4451. Located in Parshall.

Slaughter/processing business located in Esmond, ND. Fully operational meat processing facility, all equipment and supplies included. Currently custom-exempt, with option for retail and/or state inspected status, many equipment/facility upgrades last four years. Very strong customer base. Please contact Denise for more information at: 701-438-2334 or 701-351-1231.

*Housing is available and the local area market is favorable for those interested.

Find us on Facebook



Our Facebook page benefits both consumers and processors with facts about inspection, rules for producers who want to direct market their products, and tips for safely preparing meat and poultry products.

Please check out our page or feel free to ask a question by signing into Facebook and searching for North Dakota Meat and Poultry Inspection Program.



North Dakota Meat and Poultry Inspection Program
Government Organization



The Meat and Poultry Inspection Program Facebook Page

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