



SAUSAGE MAKING BASICS

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PART OF THE
AHEIA "O.W.L. SERIES"

OUTDOOR WILDLIFE LEARNING

MODULE #11





Introduction to Sausage Making

If you are looking for new ways to utilize your harvest, exploring sausage making can be a great way to expand your food preparation skills. There are a variety of different types of sausage and they are either cooked or smoked, such as pepperoni or summer sausage, or fresh such as breakfast or Italian sausage. With so many ingredients that can be included and preparation methods available, you will soon gain a new appreciation of the endless combinations that are possible. In this workbook we will cover equipment, techniques, cooking methods as well as some recipes for you to try.

Sausage Making Checklist

Since sausage making and food preparation are time sensitive, you should gather all required elements prior to starting the sausage making process. The following is a checklist to ensure you have everything you need to get started, and a list of steps that will be detailed in the workbook:

- Collect Equipment – Grinder, sausage stuffer, spices, fruit or cheese, casings
- Meat Organization – Ensure the meat remains at a food safe temperature and keep as cool as possible (4°C or colder)
- Meat Preparation – Remove and sinew, tendons etc. Remember that anything that goes into the sausage will be part of the final product;



garbage in – garbage out. You can cut the meat into smaller chunks to grind easier and inspect closer

- Prepare Seasonings/Mixes – Have the seasonings mixed and ready before adding to the meat
- Partially freeze meat prior to grinding – Partially freezing the meat will make the grinding process easier
- Grind the meat and flavourings into sausage – Once the meat is ground once, mix in the seasonings and grind again to mix thoroughly
- Partially freeze sausage – This step is optional, however when stuffing keep the meat as cool as possible
- Stuff Sausage – Using a sausage stuffer or by hand with large fibrous casings
- Cooking or Storage – Depending on the type of sausage continue to the cooking step or prepare the sausage to be frozen

Types of Sausage

Making sausage can be both rewarding and challenging. There are many different types, sizes, cooking methods and taste profiles to explore, yet they all use the same basic equipment. Sausages fall into two different categories: cooked and fresh. Fresh sausage is mixed and put into the casing and stored without cooking, such as Italian or breakfast sausages. Cooked/Smoked sausage is part of the preparation process so it will be ready to eat at any time, like pepperoni or summer sausage.



Fresh Sweet Italian Sausage (left) and Smoked Cracked Pepper & Garlic Sausage (right)

Sausage Making Equipment

Meat Grinder – Sausage is made with ground meat so unless you are buying it ground to use for the sausage, you will need a way to grind the meat. You can use any type of grinder from an inexpensive hand cranked grinder to any number of electric meat grinders.



Sausage Stuffer – Some form of sausage stuffer will be required for most sausages that you make. There are attachments which connect to the output end of a grinder which can grind, mix and stuff your sausages, making one machine very efficient. For example, to stuff your sausage casings you grind your meat, mix it in a separate tub, then put the meat through the grinder with the stuffer attachment in place. If using a grinder to stuff your sausage, ensure you remove the blade first. There are also dedicated sausage stuffers, they are either vertical or horizontal and have a cylinder that hold the mixed meat and a press or crank that pushes the meat out of a tube into the casings.

Meat Mixing – There are different methods to mix meat, there are commercial meat mixers both electric or hand cranked, or you can use a mixing bowl and your

freshly washed hands. Whichever method you use ensure that the meat and the seasoning are mixed thoroughly.



Seasonings – There are many commercial seasoning mixes or packages that include all the required seasonings and casings for different types of sausages. You can also use a homemade blend of spices to make your own flavours. No matter what spices you choose, season and adjust the flavours for the end product. If you are making cooked or smoked sausage, you will have to add cure to the mix (see below).

Casings – Sausage casings typically come in two different types: natural casings and artificial casings which include Collagen Casing, Cellulose Casing or Fibrous Casing. In each of these there are different types as well. Natural casings can consist of cattle, sheep, pig or other animal's intestinal casings. Collagen casings can come in a variety of sizes and colours, from dark red to a smoked clear colour, and are made of the collagen in cattle and pig hides, bones and tendons. Cellulose Casings are made from wood and cotton fibres which are pressed into a clear casing and are designed to be cooked with the sausage then discarded to produce a "skinless" product. Fibrous casings are used for larger sausages and typically will have strings to close the casing once full. The type and size of casing will be determined by the variety of sausage you want to make.



Vacuum Sealer – A vacuum sealer is an optional piece of equipment that when used, helps the sausage to remain in top quality condition for long periods of time in the freezer.

Scale – Often recipes and spice mixes are based on weight and not volume of sausage.



Thermometer – Having an accurate temperature probe that will register the internal temperature of the meat is essential. This will ensure that you know the sausage is cooked to the desired temperature without over-cooking.

Food Safety

If you are making a sausage that you intend to smoke or cook slowly and will be eaten later, it is imperative to use a commercial cure (Cure #1 or Prague Powder #1) which can be found anywhere sausage seasonings and casings are sold.

Cure#1 is a sodium nitrate cure that prevents botulism poisoning (common food poisoning). One level teaspoon per 5lbs of meat is the typical measurement but check the packaging for exact details. Once the cure is added it will need time to work itself into the meat, typically 24-48 hours, but will depend on the cure that was used.

Food handling while making the sausage is important and you will want to keep the meat as cool as possible. If you are working in a warm kitchen then you can use a bowl of ice under your meat bowl or refrigerate or partially freeze the meat between steps. This will keep the meat at a low temperature to prevent food borne illness.

When cooking the sausage it is imperative to get the internal temperature of fresh sausage to 74°C or 165F. When slow cooking sausages the finished temperature will be slightly lower at 68°C or 155F and the reason for the lower finished temperature is that the cure that was added. If you are using bear, cougar or wild boar meat for the sausage an internal temperature of 74°C or 165F is required to eliminate the risk of trichinosis.

Meat Selection

Often sausages are made up of a mixture of meat. There is the primary meat that is being used and if it is a lean meat such as wild game, another meat will be added to the mix to increase the fat content. Remove all sinew and tendons from the meat being used for the sausage because anything that goes into the grind will influence on the final product. The more care you take in this step to prepare the meat for grinding, the better the end result will be.

Increasing the fat content of the sausage mix increases the moisture and gives the finished sausage a better texture. If a sausage does not have enough fat content in it, it will dry out and become crumbly during the cooking process. Alternatively, if a sausage has too much fat content it will become mushy. The type of sausage



you are making will determine the type and ration of fatty meat added into the mix.

Fat Mixtures

Mixing your lean meat with fat will give you better texture and consistency to the finished product. The other bonus is that fat = flavour! A ratio of 80/20 or 80% lean meat and 20% fat is the lowest fat content without worrying about moisture content of the finished sausage. Different types of sausage benefit from a higher fat ratio than others. Fresh sausages such as Italian sausage or breakfast sausages benefit from a fat ratio up to 60/40 or 50/50 depending on the type of mix added.



Adding the right type and ratio of fat is crucial to the finished sausage. Typically, pork fat is added. This can be from grinding pork fat or trimmings which are sold at most butcher shops. If you are unable to find pork trimmings, then grinding up fatty pork cuts such as a shoulder roast is a good alternative. Ground pork bought from the grocery store is another alternative, but keep in mind the fat content of the pork you are adding. Not all ground pork will be straight fat unless you are using straight pork fat or trimmings, which have a higher than normal fat content.



Mixing pork with wild game will give it a better fat content to increase the moisture in the sausage

As you grind the meat keep the temperature in check. Start with cold meat from the refrigerator or freeze the meat for up to an hour before grinding and as the grinder heats up, take breaks to keep it cool. You do not want to start the cooking process or heat the sausage, inviting bacteria to grow. When grinding the meat alternate the lean meat and the fat to ensure they are mixed thoroughly. This will prevent pockets of fat being surrounded by lean meat which can result in it not cooking properly. Grind the meat through the coarse grinding plate and put it into a bowl to mix in the seasonings.

Seasonings

There are many different pre-made sausage seasonings that take the guess work out of making sausage. Simply follow the directions and mix in the correct amount of seasoning and cure, then continue from there. These mixes are available from many different places and often include the appropriate sized collagen casing or fibrous casing in the package. When mixing dry ingredients it is advisable to mix them thoroughly with the wet ingredients, then add the mix to the meat. If there are no wet ingredients then mix the dry ingredients with a small amount of cold water and mix that into the meat. The water will help spread the seasonings through the meat and will result in a more uniform taste profile throughout the sausage.



Seasonings mixed with water for Sweet Italian Sausage - see recipe below!

Add seasonings and cure (if making a cooked or smoked sausage) after the first grinding session then cool the meat down before grinding it again through a fine grinding plate. Alternatively if you have a meat mixer you can use that rather than grinding a second time.



Using a meat mixer or putting the mixed meat back through the grinder to mix the seasonings in the meat thoroughly – Cracked Pepper and Garlic premade mix.

At this point the taste of the sausage is set. It is recommended to take a small sample of the mixed sausage meat and cook it in a pan over medium heat. Once it is fully cooked you can sample the mixture, the taste and the consistency, which in the end will be similar if you are making fresh sausage. If making cooked or smoked sausage, the taste will be the same but without the smoke flavour. If the taste matches what you had in mind then move onto the next step. If the sausage is lacking something, add more seasoning and take another sample. At this point if you are making loose sausage to use in a recipe you can then package your meat for storage.



Try a sample of your meat mix to make sure the taste profile is what you want.

Sausage Stuffing

Stuffing sausages is an optional step that is made much easier with a sausage stuffer or an attachment for a grinder. If linked sausages are something you want to make, there are other ways to form your meat into sausage shapes and cook them. Using plastic wrap is one method: place the amount of meat in the plastic wrap, wrap tightly and roll it on the counter closing the ends. Sausage like this can be poached in the plastic wrap until the sausage is firmed up and the plastic wrap will not melt through the process. However, a dedicated sausage stuffer is much faster and makes it easier to prepare than alternative methods. A sausage stuffer will make a big difference in your ability to diversify your repertoire of different sausage types, as well as affect the quality of the final product.

An alternative to stuffing the sausages is to leave them in a patty form, individually storing them in freezer or sandwich bags. Freezing them separately allows you to pull out the appropriate number you require and cook them as you would a hamburger patty.



Natural and Fibrous casings need to soak prior to them being stuffed (left). Leave a tail end for the air to be released before tying the end closed (right).

If using natural casings, it is recommended to soak or run warm water through them. Fibrous casings will need to be soaked in cold water. Collagen casings do not require being soaked and can be put directly onto the tube or horn of the sausage stuffer. Feed the casings onto the tube of the stuffer leaving about 15cm (6") of a tail where the sausage will come out and do not tie this end yet. Place your sausage mix into the hopper of the sausage stuffer and apply pressure onto the meat forcing it to come out. The first thing out of the stuffer will be the trapped air that gets pushed through, which is why it is not recommended to tie the end of the casing until the air is forced out. Once the air is forced out then the tail end of the casing can be tied.



Pack meat into the sausage stuffer in preparation of stuffing.

As the sausage mix is getting pushed out into the casing you will need to control the pressure of your hand on the casing as well as the speed in which the sausage mixture is moving into the casing. This takes practice, and eventually you will have a good feel for using enough pressure to avoid air gaps while not applying so much pressure as to burst the casing.



Keep steady pressure when filling the casings but not too much or the casing may burst

If you are making sausage in a natural or collagen casing, then as the continuous piece is coming out of the stuffer you will have to determine how long you want the sausage. If you are making one continuous length, place the sausage in a spiral pattern as it comes out of the stuffer. If you are making the sausage into links, first allow double the length of link out of the stuffer and then twist the sausages to separate the links. Pinch the meat where you want the division of links, then press the meat in each direction allowing a bit of space. Spin the sausages in alternating directions, after the first division is made spin the sausage towards you, then for the next sausage spin the sausage away from you. Continue alternating these links in this manner until the casing runs out, or you have the desired number of links in your sausage chain. Tie the end of the casing as close as possible to the free end of the sausage keeping the appropriate amount of pressure in the casing to prevent air bubbles. If any air bubbles are seen in the sausage links after they have been tied, use a hot sanitized needle and pop the air bubbles with a prick of the needle.



Pinch the casing where you want the sausage link to be separated



Spin the first sausage one direction, then the next link the opposite direction. Pinch the next break and keep alternating the spin directions.

If you are making a large sausage in a fibrous casing, fill the casing close to the top and continually press the meat in to ensure there are no air gaps. Once the casing is filled, use the ties that are attached to the casings or if there is no tie, close the top and tie with butchers twine or a metal clip.



Fresh Sausage

If you are making fresh sausages, then once the stuffing is complete you will want them to hang on a rack for an hour or two. If you notice any air bubbles as you hang them, use a sterilized needle to poke them and release the air. This will cause the casing to tighten onto the meat. Once the sausages have air dried for an hour or two, place them in a container in the refrigerator overnight with paper towels in the bottom to absorb any excess liquid. Fresh sausage should be used within a week if stored in the refrigerator, or frozen for later use. When cooking the sausages, make sure the internal temperature reaches 74°C (165F).



Cooked/Smoked

Once the meat has been ground and stuffed into the cases, it needs time to set and for the cure to activate. Place the sausages in room temperature for two to three hours or in the refrigerator for 12 hours. This time depends on the

diameter of the sausage and the moisture content of the mixture. Once the sausage has set for an appropriate length of time, it is then time to cook. When smoking the sausage it is complete when the internal temperature comes to 68°C (155F), however do not get the temperature of the meat higher than 76°C (170F). If any part of the sausage gets above 76°C the fat will break down and render out of the sausage and you will be left with dry crumbly meat.



Preheat the smoker to 20°C (68F)-32°C (90F) to reduce the moisture in the smoker. Dry the sausage for an hour or two at this temperature until the outside of the casing is dry to the touch. This is done without smoke.

Start slowly increasing the temperature in the smoker, keeping track of the internal temperature of the sausage. Bump up the temperature of the smoker 10°C -15°C per hour until you reach a smoker temperature of 70°C-73°C (160F-165F). Continue cooking at this temperature until the internal temperature of the sausage reaches 68°C (155F). Once the internal temperature is reached then remove the sausages from the smoker and place them in an ice bath to stop the cooking process. Rinse the sausages with water and dry them. This cooking method can also be used in an oven, controlling the temperature by keeping the door slightly open if it is too hot.

Alternatively if you do not have a smoker or the smoker that you do have does not have precise controls, you can finish the sausage after the initial smoke by poaching it in water. The water temperature should be 70°C-90°C (158F-194F) which will cook the sausage until the internal temperature reaches 68°C (155F). This method will be faster and possibly more consistent to finish the sausage but will miss out on some or all of the smoked flavour. An immersion circulator is a great for finishing the sausages to the correct temperature, if one is available to you.



After smoking for an hour these sausages were placed in a water bath with an immersion circulator at 155F for 3 hours to achieve a consistent internal temperature of 155F.

Once the cooking process is complete and the internal temperature is reached, you must immerse the sausages in an ice bath or cool them with cold running water if doing larger batches of sausage. This will stop the cooking process and lower the temperature of the sausage rapidly, helping prevent the casings from shrinking or shrivelling. Once the sausages have been cooled the next step is to bloom the sausage. This is simply letting the sausage to cool at room temperature. The blooming process will make the sausage turn a deeper more uniform colour. On average 2-3 hours of blooming yields great results.



Storage

Storing the sausage is the key to making large batches remain fresh for eating. Fresh sausage can be stored in the refrigerator for short periods of time before consumption, however if they are not going to be used within a week they should be frozen. Sausages can be packaged in airtight containers or bags, such as zipped freezer bags or vacuum sealed bags. Vacuum sealed bags will best keep sausage the longest and helps to prevent freezer burn.



Smoked or cooked sausages can be stored in the refrigerator for longer periods of time, up to 2-3 weeks. They should be stored in an airtight container or bag or alternatively, they can be frozen in the container and thawed out for use later.

Centuries ago, sausage making was a way of preserving meat with salt and without refrigeration. Today they are a staple at breakfast or barbecues, used in stuffing or sandwiches, and found accompanying fine cheese, breads, and fruit on gourmet charcuterie boards. They can be made with traditional ingredients or with different meat combinations and exotic spices. By making them yourself, you can control the ingredients without the worry of preservatives or unwanted additives. Although making your own sausage may seem intimidating at first, with a little practice the results will be outstanding!

Sausage Recipes

Smoked Venison Summer Sausage

- 6.8kg or 15lbs – Venison
- 4.5kg or 10lbs – Ground Pork
- 2/3c – Salt
- 2 tbsp – Commercial Cure
- 2 tbsp – Mustard Seed
- 1/2c – Pepper
- 1/2c – Sugar
- 3 tbsp – Marjoram

Mix the venison, pork, salt and commercial cure together then place in a container and refrigerate for 72 hours. Mix the rest of the ingredients and stuff into casings then start smoking following the smoking directions above.

Venison Honey Garlic Sausage

- 6.8kg or 15 lbs - Ground Venison
- 4.5kg or 10 lbs – Ground Pork
- 4 tbsp - Salt
- 4 tbsp – Pepper
- 1 1/4c – Honey
- 4 - Garlic Cloves Crushed
- 1 tsp – Cayenne Pepper
- 1/4tsp – Sage
- 3c – Hot Water

Dissolve the honey in the hot water then add the rest of the ingredients and mix thoroughly. Mix with the meat and stuff into casings.

Smoked Venison Summer Sausage

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- 2 tbsp – Commercial Cure
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- 1/2c – Pepper
- 1/2c – Sugar
- 3 tbsp – Marjoram

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Bratwurst

- 1.4kg or 3 pounds fine grind game meat
- 0.9kg or 2 pounds fine grind pork shoulder
- 2 teaspoons ground mace
- 2 teaspoons white pepper
- 1 cup whole milk (cold)
- 2 teaspoons ground nutmeg
- 1 tablespoons kosher salt
- 1/2 teaspoon ground ginger
- 3 large eggs
- 1 teaspoon garlic powder

Place eggs in large mixing bowl and beat well. Add all other ingredients and mix well by hand until everything is well incorporated.

Refrigerate mixture for 3-4 hours.

Stuff in 30 mm casing (or one of your personal preference) or simply make into patties.

Wrap and place in freezer until ready cook and enjoy them.



Salami

- 0.68kg or 1 1/2 pounds medium grind game meat
- 0.22kg or 1/2 pound medium grind pork shoulder
- 1/4 teaspoon garlic powder
- 1/4 teaspoon onion powder
- 1/2 teaspoon whole mustard seed
- 2 tablespoons Morton Tender Quick
- 1 tablespoon course ground black pepper
- 1 teaspoon red pepper flakes
- 1 teaspoon liquid smoke
- 1 teaspoon Worcestershire sauce

In a large bowl, mix together ground meat, garlic powder, onion powder, mustard seed, curing salt, black pepper, liquid smoke, Worcestershire sauce and red pepper flakes. Mix well by hand so that everything is well incorporated.

Roll the mixture into a 2" diameter log and wrap tightly with aluminum foil. Refrigerate for 24 hours.

Preheat oven to 325 degrees F. Make a few slits in the bottom of the foil to allow fat to drain while cooking. Place roll onto a broiler pan and fill the bottom of pan with about 1" of water. This will help keep the salami moist.

Bake for 90 minutes, remove from pan and cool completely before unwrapping. Slice and serve.

Goose Garam Masala Sausage

- 4.5kg or 10 pounds medium grind goose meat
- 1 cup ice water
- 2 tablespoons kosher salt
- 1 tablespoon Prague powder #1/Commercial Cure
- 2 tablespoons corn syrup solids (Maltodextrin)
- 5 tablespoons Garam Masala
- 1 tablespoon Phos B (Brifisol)

Spice mix

- 1/2 cup coriander seed
- 2 tablespoons whole cloves
- 1/2 cup cumin seed
- 2 tablespoons brown cardamom pods
- 3 tablespoons black pepper corns
- 1 tablespoon nutmeg
- 2 tablespoons whole cinnamon sticks
- 2 bay leaves

Lightly toast above spice mix in a dry frying pan over medium-low heat. Stir constantly making sure the spices do not get too brown or burn. Set aside to cool. Once cool add 1 tablespoon ground ginger.

Place toasted spices and ginger in a spice grinder and process. Place in an airtight container and set aside.

Combine all ingredients and mix well. Stuff in 30 mm casing (or one of your personal preference). Let hang for 24 hours then smoke until done.

Fresh Sweet Italian Sausage

- 2.25kg or 5lbs meat mixed 60/40 or 70/30 lean meat to fat
- 2 tbsp and 1 tsp - Kosher Salt
- 3 tbsp - Sugar
- 2 tbsp - Fennel Seeds
- 3-4 - Garlic Cloves
- 1 tsp - Dried Basil
- ½ tsp - Dried Rosemary
- 1 tsp - Black Pepper
- 1 tsp - Dried Oregano
- 1/2c - Chopped Parsley
- 1/2c - Chilled Beef or Chicken Broth
- Sausage casings either hog casings or 32mm collagen casing

Mix ingredients thoroughly and mix into meat mixture. Stuff into casings making links or a length of sausage twisted into a loop or spiral, depending on desired length.

Kubi Burgers

- 2.25kg or 5 pounds medium grind meat (3 pounds wild game and 2 pounds pork trim or pork shoulder)
- 1 1/2 tablespoons kosher salt
- 1/2 tablespoon Prague powder #1/Commercial Cure
- 1 garlic clove (minced)
- 1 1/4 tablespoons black pepper (ground)
- 1/2 teaspoon marjoram (ground)
- 1 cup ice water
- 1/2 teaspoon coriander (ground)

Combine spices, meat and ice water. Mix well and form 1/3" thick patties. Chill for 24 hours then smoke until done.

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