



## ADDITIVES INFORMATION SHEET

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Most **Additives** used in sausage & jerky making are not spices and do not do necessarily "Season The Meat". They usually perform a function such as retaining color or moisture. They can also protect meat from bacteria while smoking or drying. However, some additives such as cures do affect taste and color to a degree. Always follow the directions provided and do not add more than directed.

Additives are also used to improve food by:

Improving the keeping quality of a food by making it last longer on the shelf or in the fridge - Cures are used, for example, prevent the growth of bacteria. Binders are used to stop food from drying out.

Improving to the taste and the appearance of foods by using enhancing flavors and colors.

Another benefit of food additives is that consumers can be offered a wider choice of foods. Many processed foods contain additives. Some common examples are bacon, margarine, ice cream and bread.

Some people believe that because food additives are chemicals they should be banned. However, everything in the world, including the food we eat and our bodies is made of chemicals. Air, water, glucose and salt are chemicals in the same way that food additives are. Many food additives occur naturally, such as red color from beetroot (Beet red), and purple color from grape skins (anthocyanins). These colors can be extracted and added to foods. Some food additives found in nature can be manufactured, for example, ascorbic acid. Other additives are manufactured but not found in nature, such as aspartame, which is used to replace sugar

**BINDERS - Also known as Soy, Soy Protein Concentrate, Soy Flour, Soy Grits, Soy Protein Isolate** - All soy products have a high protein value. This gives soy its binding capability, allowing you to add water (called added water) to your sausage for a moister product. These ingredients are used to prevent weight loss and shrinkage to products being processed in the smokehouse, by helping to retain the natural juices (called bound moisture) in the meat. This product also helps to bind the sausage together and can be used in meat products such as burgers to retain the natural juices from cooking out. Although not generally used in fresh sausages it may be added with good results. You should use the following ratios:

- Smoked products Use binder up to 5% of the meat weight.
- Fresh products Use binder up to 3% of the meat weight.

Sausage binder weighs out at about 4 oz. per cup so 4 cups would equal about one lb.

Soy grits are used in patties and products like Hamburger Helper®.

Soy protein concentrate is made from the refining process of soy beans

These binders are ineffective for the most part of holding water and the natural juices, which are in the meat (called bound moisture) at temperatures in excess of 165°F.

**POTATO STARCH "BOOM"** - A very high-quality binder that will hold fat & has superior water holding capacity. Great for keeping very lean products moist during processing & cooking. Mix in this product after the cure, salt and seasonings have been added to meat mix.

Recommended applications - reduced fat emulsified meat products, marinades and hams

- Hi Viscosity
- Improves yield
- Non-allergenic
- Bland flavor - Will not add unacceptable flavor
- One to one replacement with milk



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### CARROT BINDER "C-BIND"

Use as an alternative to soy binder, soy protein & dry milk. This binder is created from carrot fiber. Will hold up to 27 times its weight in water thus retaining moisture & delivering a juicier product. It does not effect the taste of the product.

All natural

"GRAS" approved

Non-HMO

Non-allergenic

Isolated Carrot Product

1-1/2 oz. Pkg- dos 25 lb of sausage

**WATER** - Water is used in sausage making to add moisture to the meat, to add lubrication to the stuffing process and to help distribute the seasonings through out the meat. This water, called added water, will cook out of the meat before the natural moisture, called bound water, cooks out of the meat. Thus, you have a moister product when cooked. Water is also added to lubricate the meat making it easier to stuff into casing. Adding water to the seasoning and ingredients helps carry them into the meat and distributes them evenly during the mixing stage. You can add water up to 10% of the meat weight. Always use ice-cold water.

Water is also used to shower the finished product after smoking. This stops the cooking process and prevents swiveling. Some water supplies have high lime contents that leave white powder spots on sausage after showering. Check for hard water.

**CURES** - Cures are used in sausage products for color and flavor development as well as retarding the development of bacteria in the low temperature environment of smoked meats.

Salt and sugar both cure meat by osmosis. In addition to drawing the water from the food, they dehydrate and kill the bacteria that make food spoil. In general, though, use of the word "cure" refers to processing the meat with either sodium nitrite or sodium nitrate.

The primary and most important reason to use cures is to prevent BOTULISM POISONING (Food poisoning). It is very important that any kind of meat or sausage that will be cooked and smoked at low temperature be cured. To trigger botulism poisoning, the requirements are quite simple - lack of oxygen, the presence of moisture, and temperatures in range of 40-140° F. When smoking meats, the heat and smoke eliminates the oxygen. The meats have moisture and are traditionally smoked and cooked in the low ranges of 90 to 185° F. As you can see, these are ideal conditions for food poisoning if you don't use cures. There are two types of commercially used cures.

#### **Prague Powder #1**

Also called Insta-Cure and Modern Cure. Cures are used to prevent meats from spoiling when being cooked or smoked at low temperatures (under 200 degrees F). This cure is 1-part sodium nitrite (6.25%) and 16 parts salt (93.75%) and are combined and crystallized to assure even distribution. As the meat temperate rises during processing, the sodium nitrite changes to nitric oxide and starts to 'gas out' at about 130 degrees F. After the smoking /cooking process is complete only about 10-20% of the original nitrite remains. As the product is stored and later reheated for consumption, the decline of nitrite continues. 4 ounces of Prague powder #1 is required to cure 100 lbs of meat. A more typical measurement for home use is 1 level tsp per 5 lbs of meat. Mix with cold water, then mix into meat like you would mix seasonings into meat.



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### **Prague Powder #2**

Used to dry-cure products. Prague powder #2 is a mixture of 1-part sodium nitrite, .64 parts sodium nitrate and 16 parts salt. (1 oz. of sodium nitrite with .64 oz. of sodium nitrate to each lb. of salt.)

It is primarily used in dry-curing Use with products that do not require cooking, smoking, or refrigeration. This cure, which is sodium nitrate, acts like a time release, slowly breaking down into sodium nitrite, then into nitric oxide. This allows you to dry cure products that take much longer to cure. A cure with sodium nitrite would dissipate too quickly.

Use 1 oz. of cure for 25 lbs. of meat or 1 level teaspoon of cure for 5 lbs. of meat when mixing with meat.

When using a cure in a brine solution, follow a recipe.

**SWEETENERS:** Sugars are use to add flavor and to cover or mask salt. Sugars will cause browning when the product is pan fried or grilled. There are different forms of sugar. The most common is cane sugar. Cane is what we normally call table sugar. It can be used in meat brines but is not widely used in sausage because it has a tendency to burn or scorch. Brown sugar is used in most brines but sometimes used in meat because of its flavor.

**DEXTROSE** - 70% as sweet as cane sugar and quite a bit heavier. Helps reduce nitrate to nitrite as meats are cured.

Used to counter salt in brines. Dextrose assists fermentation, which gives us the desired tang of flavor. The most common sugar used in meat is dextrose. Dextrose is corn sugar and it will not burn as easily as cane or beet sugar. When a recipe calls for cane sugar you can replace it with dextrose by adding 20% more dextrose than cane sugar due to the sweetness factor between cane sugar and dextrose.

**MAPLE SUGAR** - Used in producing bacon - adds flavor and aroma.

**CORN SYRUP / CORN SYRUP SOLIDS** - Only about 40-50% as sweet as cane sugar. will help to hold water and color in meat, bind the meat when curing sausage at low temperatures, aid the fermentation process when semi-dry or dry curing. Add no more than 2% of the green weight of the meat.

### **TREHALOSE - Nature's Miracle**

- A natural sweetener and flavor enhancer
- An antioxidant
- Increases shelf life for both fresh & frozen meats and sausages
- Removes "gamey flavors"
- Will increase salt flavor in low salt products
- 6 oz to 25 lb of meat

**NON-FAT DRY MILK** - Milk powder has been used for years in sausage making. Acts as a binder by helping to retain the moisture of the meat. Although not highly effective as a binder, it can impart a creamier taste to some sausage products. You can use up to 12% (of the meat weight) without affecting the taste of the sausage. This product is good at hiding salt flavor in most sausage and is used in liver sausage, hot dogs and bologna

**FERMENTO** - Use to produce a tangy taste in sausage such as summer, pepperoni and thuringer. The recommended level to start with is 3%, add up to 6% to produce a tangier taste, but do not exceed 6% or the sausage will become mushy. This product does not require refrigeration.



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**SODIUM ERYTHORBATE:** Sodium Erythorbate is the salt of Ascorbic acid (vitamin C). Erythorbates role in cured meats is as a curing accelerator - it increases the rate at which nitrate reduces to nitric oxide, thus facilitating a faster cure. An antioxidant that prevents oxidative rancidity and help avoid pigment oxidation. (Retains the pink coloring). Erythorbate allows you to cook and smoke cook meats containing sodium nitrate and sodium nitrite, such as sausages, hot dogs & beef sticks, immediately after stuffing. For hams, bacon, or whole muscle meats you can usually smoke, or smoke cook 24 hours after injection and brining curing.

When used in sausage, add 1 ounce per 100 pounds of meat. For brines and injection, use 1 ounce per gallon of brine made.

NOTE: When using pre-mixed seasoning, please check the label before adding Erythorbate, as some of pre-mixes blends contain Erythorbate in them

**SODIUM TRI POLY PHOSPHATE** (Also known as **SODIUM PHOSPHATE**) is a food grade phosphate that is used with meat products to help in the retention of moisture and soluble proteins. Sodium Tripolyphosphate is compatible with all curing ingredients such as nitrites, nitrates, sugar, salt and ascorbic acid or its derivative, sodium erythorbate

**USAGE REQUIREMENTS:** The maximum amount of phosphate permitted by the USDA is no more than .5% to be retained by the meat in the finished product.

**DIRECTIONS FOR USE:** Dissolve the sodium phosphate in water using the recipe below, to produce the .5% limit suggested in the guidelines. Use 8 Oz. per 100 lb. of meat.

**EXAMPLE:** For 100 lb. of sausage use the following recipe.

Meat	100.00 lb.
Water / Ice	4.00 lb. (2 quarts)
Sodium Tripolyphosphate	½ lb. (1 and 1/2 cups)

If you are pumping meat, such as brisket, with the solution, weight the meat and then weigh the phosphate (using the ½ lb. per 100 lb. of meat ratio) and add that amount of phosphate to the water.

Example: For A 10% pump for 25 lb. of meat you would need 2.5 lb. of water and 2 oz. of phosphate.

**NOTE:** The water may be tap water if necessary, to dissolve the phosphate, but the water with phosphate solution should be ice water cold when actually used with the meat. Try dissolving the phosphate in a small amount of the water with the remaining water being ice water.

**POTASSIUM SORBATE** is the potassium salt of sorbic acid, an organic acid that has been used extensively as a fungistatic agent for foods. Potassium Sorbate is used to inhibit molds, yeasts, and fungi in many foods, such as jerky, cheese, beer, wine, and baked goods. It inhibits the growth of microorganisms in food, which increases product shelf life and is a commonly used as a food and beverage preservative. Add to wine, beer, jerky, salsas, tomato sauces, etc.

- Wine & Beer - Potassium Sorbate is commonly used in wine making after the fermentation process is complete. It prevents yeasts & molds from reproducing, which helps prevent the wine from spoiling - Use 1/2 teaspoon per gallon to stabilize wine & beer
- Meat - Potassium Sorbate is commonly used in meat dry curing to inhibit surface mold & yeast growth. On sausages dissolve in water & apply by soaking casings in solution prior to stuffing - 1 oz. to 40 oz. water
- Jerky - Potassium Sorbate is commonly used in jerky to inhibit surface mold - Spray or dip stuffed product prior to hanging. 1 oz. to 40 oz. water



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**ANTIOXIDANT:** Antioxidant are used to slow the oxidation of fat in meat products that causes the browning naturally. This product is usually used with fresh meats. Antioxidant is composed of Salt (95.8%), BHA (1.4%), BHT (1.4%), and Citric Acid (1.4%).

**USAGE:**

Use 4.0 oz. per 100-lbs. meat with 35% fat content

Use 3.5 oz. per 100-lbs. meat with 30% fat content

Use 3.0 oz. per 100-lbs. meat with 25% fat content

Use 2.5 oz. per 100-lbs. meat with 20% fat content

**ENCAPSULATED CITRIC ACID:** Use encapsulated citric acid when making summer sausage or snack sticks and that distinctive "tang", associated with reduce pH, is desired but the lengthy fermentation cycle is not. When used correctly, it is almost impossible to tell if the sausage was manufactured by fermentation or by the use of this product. There is no need to worry about processing under special conditions. You just add the citric acid to the meat at end of the mixing process (making sure that you do not grind meat again), and then blend into the meat by hand or by mixer. If using a meat mixer, mix only until the encapsulated citric acid is blended into the meat mix, usually about one minute is enough. Longer mixing can cause the capsules to rupture resulting in the premature release of the citric acid.

Encapsulated citric acid is citric acid, a naturally occurring acid that has been encapsulated (coated) with maltodextrin, a hydrogenated vegetable oil, which will melt at 141-147 degrees F. releasing the citric acid into the meat product. This prevents the citric acid from releasing and prematurely lowering the ph of your sausage meat mix. If the meat's ph drops before the protein sets at 105-115 degrees, you will get a negative effect on the texture of your finished sausage. It won't bind as well, and the texture will be crumbly.

Encapsulated citric acid should be added and mixed in after the grinding is complete as not to rupture the capsules. Since the encapsulation prevents release into the meat until the meat's internal temperature reaches 141-147 degrees F. a ruptured or damaged capsule will release the citric acid prematurely causing the undesired affects listed above.

Once the capsule is melted releasing the citric acid into the product decrease in pH is achieved resulting in the distinctive "tang" or sour taste associated with reduced pH products.

Suggested usage for this purpose is 3 oz. for 25 lb. of meat. **(Too much Citric Acid will cause the meat to turn white.)**

Also use to preserve color of fresh sausage during storage. Use 1/2 oz. to 1 oz. per 100 lb. of meat for this purpose.

Use **Citric Acid** to raise the acid level in low acid varieties of tomatoes. Once considered an acid food that could be safely canned in a boiling-water canner. However, when some newer, less acidic varieties of tomatoes are canned, certain precautions must be taken to trevent the potential for botulism.

Home brewers often use citric acid, for example to lower mash or water pH and adjust to acid level in fruit wines.

**SMOOTH ACID BLEND**

Use as you would use encapsulated citric acid. This product will produce a smoother - less tart taste because while containing some citric acid, it also contains trehalose - a natural sugar, as well as lactic acid - a natural product used as an ingredient in many fermented products.

7-3/4 Oz. drops the pH of 25 lbs. of meat to 4.9

Cuts the drying time

Produces a firmer sausage.

Encapsulated to release on temperature rise (150° f. - Internal meat temp.) So, this product is intended for use in products that will be heated such as smoked and semi dried

To be added to the mix after the grind as to not rupture the capsules



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**SODIUM BISULFITE** is a clear or milky white liquid with a sulfurous odor and is used in fruit canning to prevent browning (caused by oxidation) and to kill microbes.

Sodium bisulfite is used in almost all commercial wines, to prevent oxidation and preserve flavor.

Sodium bisulfite releases sulfur dioxide gas when added to water or products containing water. The sulfur dioxide kills yeasts, fungi, and bacteria in the grape juice before fermentation. When the sulfur dioxide levels have subsided (about 24 hours), fresh yeast is added for fermentation.

Sodium bisulfite (usually with an acid like citric acid to make it produce gas faster) is used to sterilize winemaking equipment.

It is later added to bottled wine to prevent oxidation (which makes vinegar), and to protect the color of the wine from oxidation, which causes browning. The sulfur dioxide displaces oxygen in the bottle and dissolved in the wine. Oxidized wine can turn orange or brown, and taste like raisins or cough syrup.