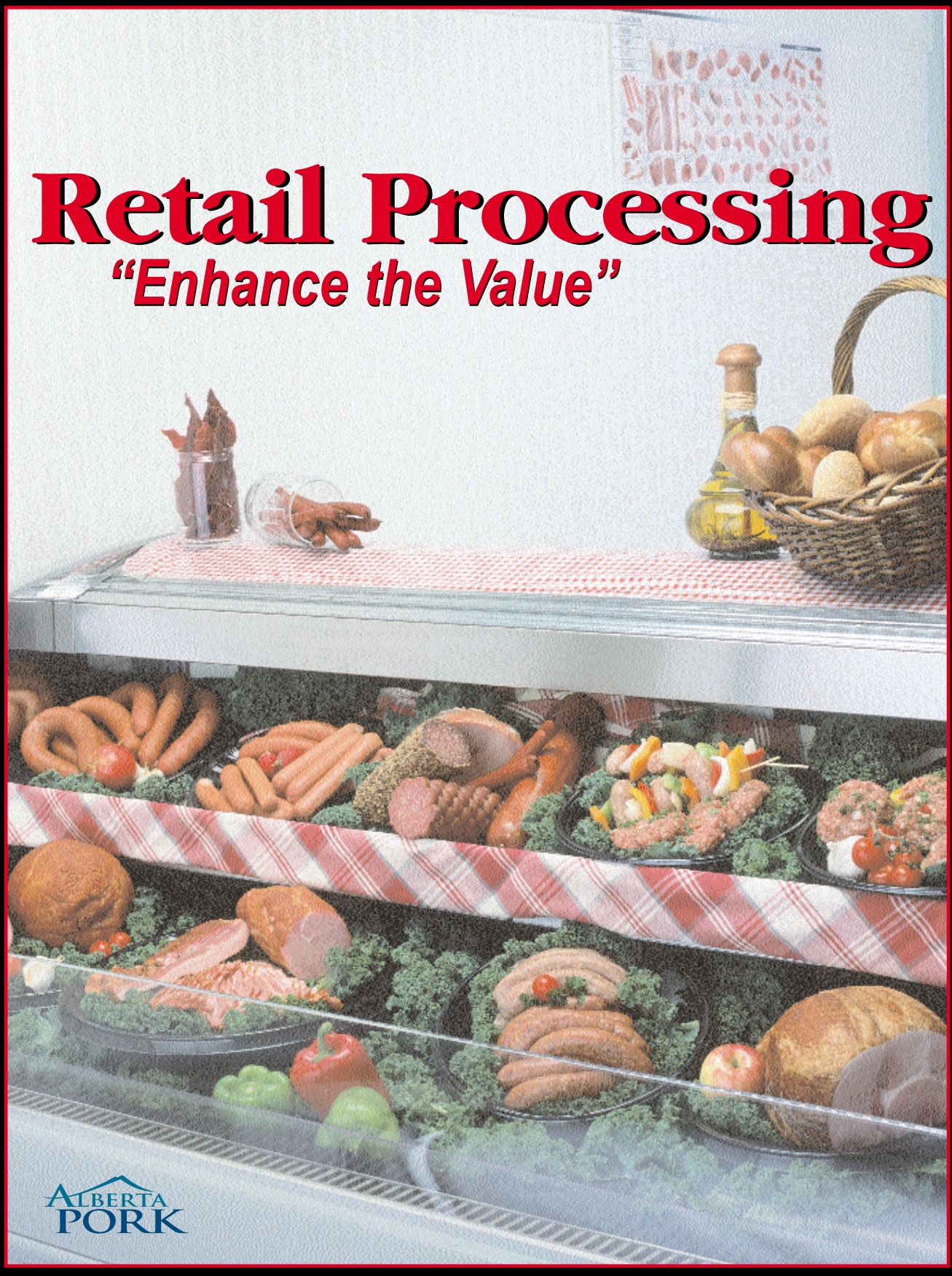
Retail Processing

"Enhance the Value"



ALBERTA PORK

History

The history of sausage production parallels the recorded history of man and civilization. It has been the driving force of technology and exploration for thousands of years. Even those of us who have been in the retail end of the meat industry for years have always taken the processing part of the industry for granted. We, as retailers, assume that we know all there is to know about meats. By doing so, we are missing out on the most exciting and challenging segment of our industry, processing. Besides being a specialist in fresh meat, cooking, smoking and packaging, a processor must also become a microbiologist. He must know how to not only control the bacteria in meats, but in some cases make bacteria work for him.

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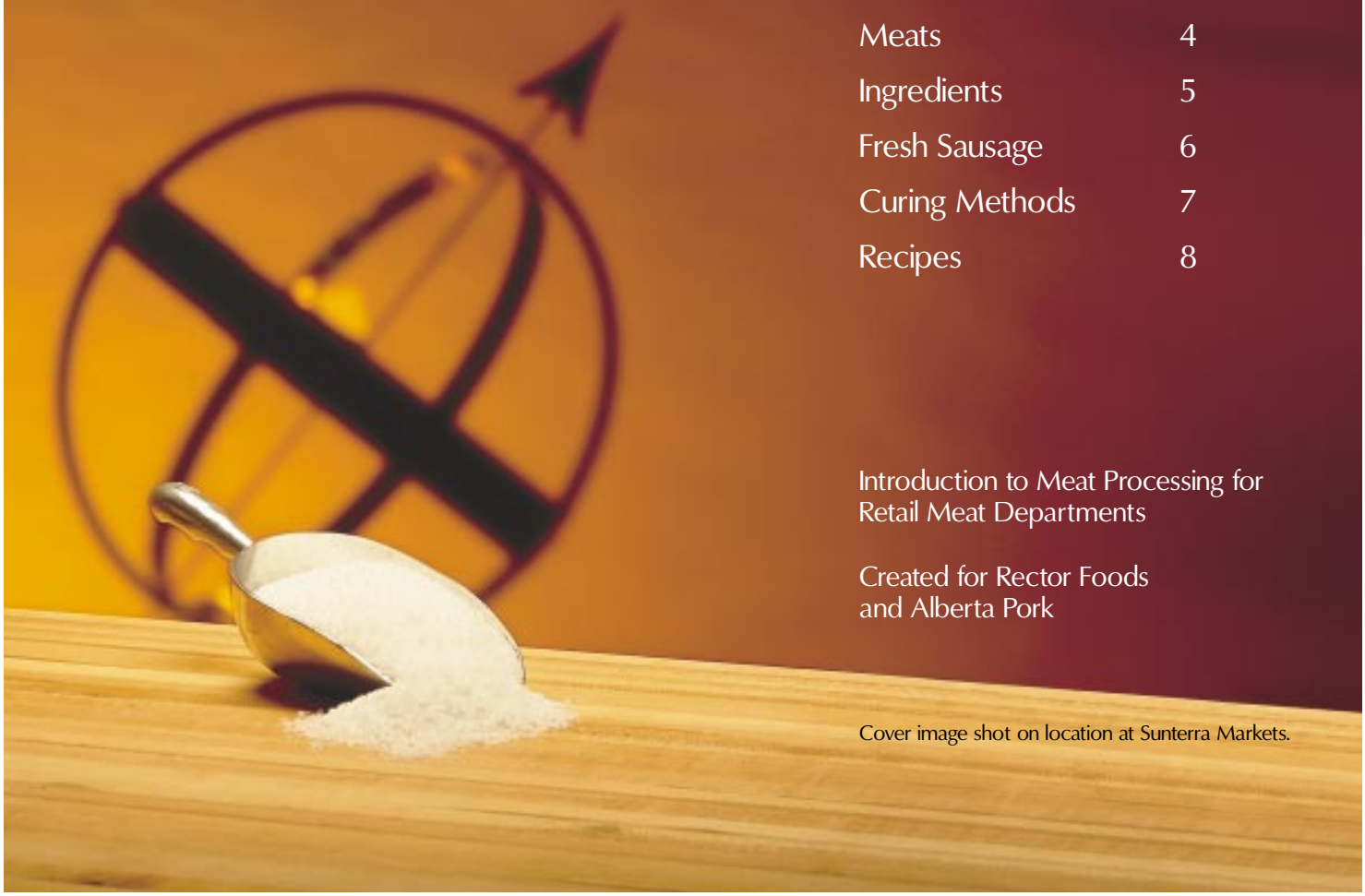
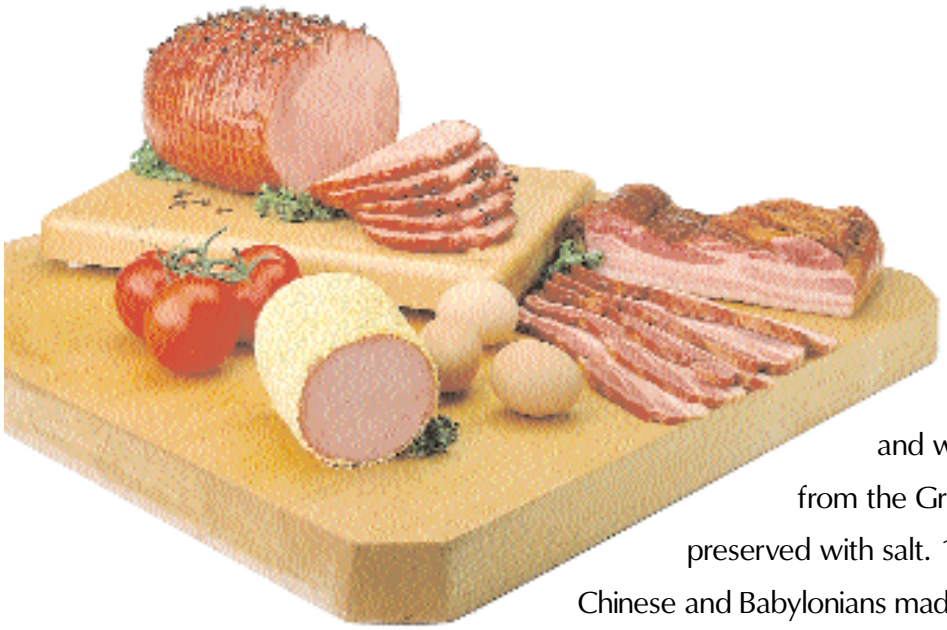
Introduction to Meat Processing for Retail Meat Departments

Created for Rector Foods and Alberta Pork



Cover image shot on location at Sunterra Markets.



The history of the meat industry is fascinating. It is amazing how much history is written around the pursuit of food, flavourings for food and ways to preserve food. Sausage comes from the Greek word "Salsus", meaning salted, or preserved with salt. 1500 years before Christ, both the Chinese and Babylonians made a crude form of sausage and stuffed it into a sheep stomach. 500 years before Christ, reference was made to salami from the ancient city of Salamis, on the East Coast of Cyprus. Sausage was even banned and bootlegged during the reign of the great Emperor Constantine, because it was so popular.

As the industry evolved, each community developed its own brand of sausage. The flavour profile largely depended on regional ingredients. The names of the sausage we have today originated from the name of the community the sausage was developed in.

The Preferred Choice for Value Added

How about trying something new that will expand your product line and bring a premium margin. By offering a in-store-made new product, available only at your retail location, you can attract new clientele to your store.

This manual is not intended to teach all there is to know about processing. However, it does provide a good base to start from and highlites aspects that are important to be aware of before venturing forward. Do's and don'ts are covered, as well as a basic understanding of the ingredients and the methods used in creating your product.

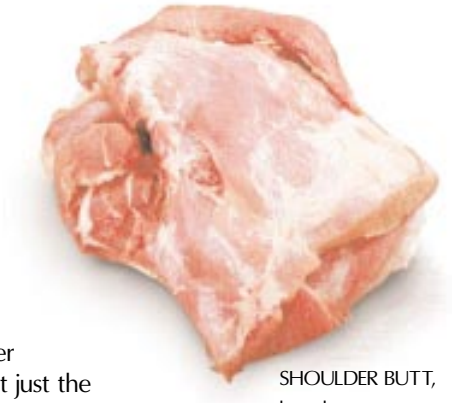
Meats

A good understanding of the quality of the meats used, can make difference between your product and your competitor's. In sausage making, one of the most important aspects is the pH level of the meat. The pH level is a method of measuring the meat's ability to hold moisture within the product. This is important, because the trend toward a leaner product has forced us to replace fat with water. The normal pH level for fresh meat should be 5.2 to 5.6. Any variations above or below that level can affect the final outcome.

LEG, bone-in

Pork has traditionally been the "Preferred Choice" for processed products, partly due to meat availability, but also due to the nature of the meat itself. Pork has a mild flavour, which works well with other ingredients, such as spices, because it does not conflict with the spice. Strong flavoured meats tend to overpower the added ingredients. Pork fat is often chosen, even when creating a beef product, to give flavour and texture. Colour is also a factor, to create needed eye appeal; pork allows the colours of the seasonings to show.

In pork, several issues affect the pH level. Pale Soft Exudative (PSE), creates an unusually pale, watery pork. Conversely, Dry Firm Dark (DFD) pork, is similar to a dark cutter in beef. Both will negatively affect the final outcome of the product. There are several causes of PSE; stress shortly before slaughter is often the major reason. There are devices on the market to detect PSE, but usually an educated eye will detect it, simply by knowing what colour to look for.



SHOULDER BUTT, boneless

Part of the art of sausage making involves buying quality raw materials. As with any meat product, it is important to use only fresh ingredients. Choose lean fresh trim to ensure customer satisfaction. Selecting the trim to get just the right fat content is crucial to developing Least Cost Formulations*. While pork shoulder is the most popular for sausage making, you may still want to adjust your blend with either fat trim or lean trim.

SHOULDER BUTT, capicoli

refer to Costing and Computers

Equipment

By ensuring the meat is chilled to just below 32° F (0° C), you minimize the fat smearing. There are two important practices you need to remember when working with equipment such as grinders. Sanitation, your products shelf life depends upon it. Equipment should be cleaned at least daily. Heat, the more you work your mixture, the more you generate heat. This will increase the opportunity for bacteria to grow. When grinding the meat, sharp grinder blades will produce a more efficient grind, without generating extra heat. Be sure to always use matching plates and knives, and never let the grinder run without any meat going through the head.

Ingredients

Traditionally, the sausage maker would use his or her own special blend of ingredients. Today, for commercial use and because it is important to get just the right blend, it is often better to buy pre-blended spices. As well, the government has strict guidelines on the amounts of certain ingredients you can use, such as preservatives. There are roughly 50 spices and blends available to the average sausage kitchen, one third of which did not exist 100 years ago. Ten of these have been developed in the last ten years. Work closely with your spice supplier to keep up-to-date on product knowledge.

Spices also have a shelf life. A rule of thumb is to carry enough for no more than a six-month supply. Spices lose their flavour when exposed to air, so storage in airtight containers is essential. Heat, light and moisture will also detract from the quality of spices. Prices vary considerably and so does strength and quality. As the amount needed is generally minimal, it does not pay to scrimp on price. Stick with a reputable spice supplier, one who knows his products and your industry.

Different ingredients fall into different categories. The common ones are listed below.

Spice - Seasonings that are derived from roots, bark, stems, leaves, buds, seeds or fruit.

Herbs - A spice that is the leaf of a plant from a more temperate climate. Bay leaf, marjoram or oregano are examples. Generally the leaves are dried and crushed.

Seeds - Generally seeds and small fruit from plants grown in a more tropical climate. Caraway, cardamom or celery are examples.

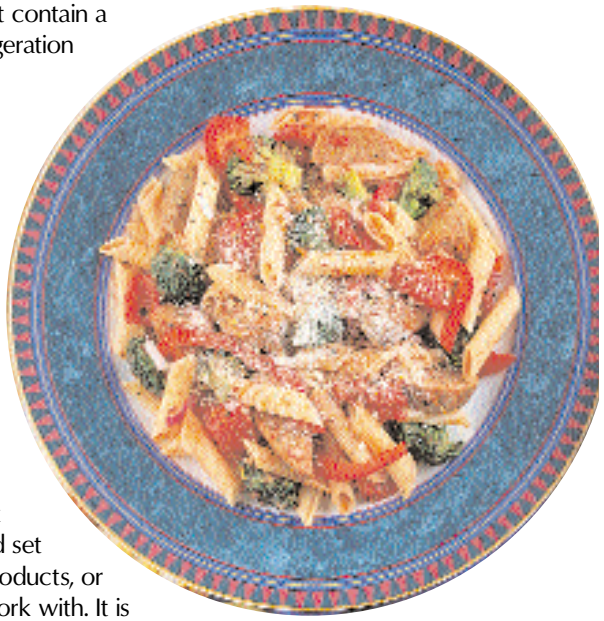
Blends - As expected, are mixtures of spices.

Seasoning Salts - A mixture of seasonings with a salt base.

As well, some ingredients require a thorough understanding of what they do, and the potential hazards involved. Ingredients that affect the shelf life, the ability to retain moisture, and the colour of the final product, are all regulated. The Canadian Food Inspection Agency has strict guidelines regarding these ingredients and it is important to be aware of these guidelines. This is not to suggest that these products are unsafe; if used properly they can dramatically improve the quality of your product, but there are guidelines to control the amount you use, and more importantly how you label your product's ingredient list.

Fresh Sausage

After determining the right meat quality and most efficient costing formulas, you can move on to making fresh sausage. The definition of a fresh sausage, is one that does not contain a curing agent, is neither cooked nor smoked, and therefore still requires refrigeration for storage. Varieties are numerous, but the most common types include:



- **Breakfast Sausage**
- **Bratwurst**
- **Italian (Hot and Sweet)**

Begin by ensuring your meat is properly refrigerated. As with any ground meat, when meat touches meat, the surface turns dark, and that can affect the colour of the sausage. Try not to mix overly large batches. Mix only what you can stuff into the sausage casings that day. Freeze the remaining product as soon as possible. Even the freezer will not protect your mixture indefinitely. Certain ingredients, such as garlic, will lose their flavour after six weeks. Some sausage makers like to allow the mixture to sit overnight before stuffing. This allows time for the seasonings to dissolve and set into the meat. This is absolutely true, but if the sausage contains salt, milk products, or soy protein, the mixture will set like cement and become very difficult to work with. It is better to stuff the sausage first, then hold it in the cooler overnight.

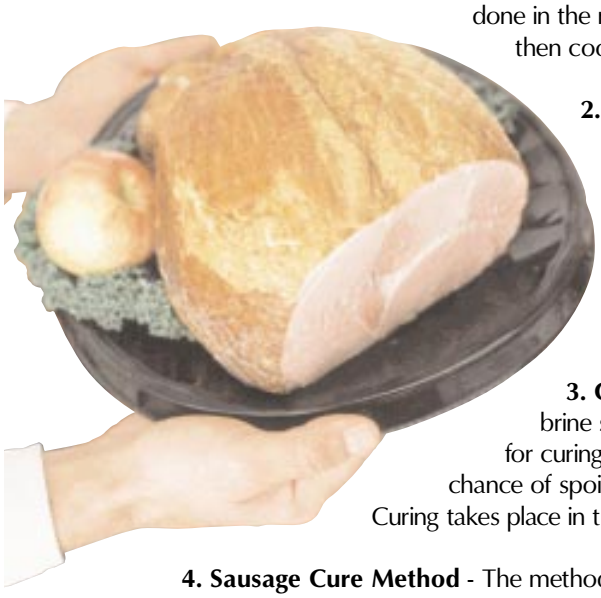
Casings

For centuries, the intestinal tracts of animals have been used as sausage casings. Only during the last one thousand years, has sausage-making come into its own as a respected and highly developed craft. Today there are numerous types of sausage casings, including natural and artificial. Collagen, cellulose and plastic casings are relative newcomers to the artificial field. Small intestines are collagen in nature and have many of the same characteristics common to all types of collagen casings, particularly the unique characteristic of variable permeability.

The debate as to which is better, natural or artificial casings, should be reviewed with your supplier.

Curing Methods

It is important to understand the different types of curing methods, their application and to which items they apply.



1. Dry Curing - Dry curing involves applying the cure mix directly on the meat. Curing is done in the refrigerator. After curing, the meat is rinsed to remove the excess salt and then cooked. Dry curing is used in ham and bacon, as well as smaller cuts of meat.

2. Brine Curing - Brine curing, also called a sweet pickle cure, is a popular curing method. It involves mixing the curing salt with water to make a sweet pickle solution. The meat is cured with this brine by using a meat pump, an injector or by soaking the meat for a specific time. Curing takes place in the refrigerator and the meat is cooked and/or smoked after curing. Often larger cuts of meat and poultry, such as ham and turkey, are injected with a sweet pickle cure. Smaller products, including whole chicken and fish, may be soaked in a brine curing solution.

3. Combination Cure - The dry rub cure is combined with an injection of brine solution (also known as a sweet pickle solution). A combination cure is used for curing ham. This method shortens the curing time required and reduces the chance of spoilage, because the cure process takes place inside and outside the ham. Curing takes place in the refrigerator and the ham is cooked after curing.

4. Sausage Cure Method - The method for making cured sausage is different from the curing methods described above. Curing salt and spices are mixed with ground meat. Curing takes place in the refrigerator and the sausage is cooked and or smoked after curing.

Smoking

Smoking is more art than science. It adds flavour, ...rately preserves the product. Two types of smoke can be used. Vaporous smoke uses traditional wood chips. Liquid smoke is made from traditional smoke, but has had the undesirable particles, such as Bensopryrene, removed. Be careful choosing your own wood chips for smoking. Certain coniferous trees, such as pine, contain too much resin, resulting in a high tar content and bitter flavour. Hickory is a more popular choice, and most hardwoods are safe. Wood choice can be a crucial factor in developing your smoked product, so choose wisely.

Recipes

Try using Fresh sausage for stuffed peppers, mini spiced sausage links for kebabs, patties and Crown roast stuffings. Experiment adding nuts, fruits and berries to capture the flavour of the season. These valued added products will keep the consumer coming back to try each new product your retail location prepares.

Bratwurst Fresh Sausage

Pork Butts, boneless	22.68 kg
Crushed Ice	500 g
Yes Group Bratwurst Seasoning	Unit 450 g

Grinding and Mixing
Chill meats thoroughly 28 to 32˚F (-2 to 0˚ C) and grind through a 1/4" (6 mm) plate. Place in mixer along with ice and seasoning unit. Mix thoroughly but do not over mix as this will smear the sausage. Regrind this through a 1/4" (6 mm) plate.

Stuffing
Stuff into well-flushed small hog casings (32/35, 29/32). Link the sausage into small links and place on a styro-foam or metal tray and place the tray into the cooler for one hour to set the color of the sausage. Transfer the product from the freezer to the display case.

Cooking
Pre-steam with water then pan-fry until golden brown in color. This product in Canada is normally sold fresh, finely chopped and presented in natural sheep or hog casings. The seasoning traditionally is based on white pepper, caraway, and a fairly strong level of mace. Quality meats are used as this is a premium product. There are no standards of identity so your imagination is the limit as to coarseness, seasoning levels, and meat blocks.

Pure Fresh Sausage

Pork Butts, boneless	22.68 kg
Crushed Ice	4.3 kg
Yes Group Bratwurst Seasoning	Unit 1.77 kg

Grinding and Mixing
Chill meats thoroughly 28 to 32˚F (-2 to 0˚ C) and grind through an 1/3" (8 mm) plate. Place in mixer along with ice and seasoning unit. Mix thoroughly but do not over mix as this will smear the sausage. Regrind through a 1/4" (6 mm) plate.

Stuffing
Stuff into well-flushed small hog casings (32/35, 29/32) or 22mm or 30 mm collagen casings, depending upon local market preferences. Link the sausage into small links and place on a styrofoam or metal tray and place tray into the cooler for one hour to set the colour of the sausage. Transfer the product from the cooler to the display case.

Cooking
Pre-steam with water then pan fry until golden brown in colour. This same recipe can be used with the following flavours as well: Fresh Garlic, Farmers, Octoberfest, Herb & Garlic, Cranberry-Maple, Honey-Garlic, English Banger, Chorizo, and Savoury Pork Apple Fresh Sausage. Product is ready for sale. It should be refrigerated until sold.

Ham Sausage

Coarse Mix: Pre-cured Lean Pork 95% preferably ham	15.91 kg
Fine Mix: Lean Pork Trim	85/15 5.0 kg
Pork Back fat	1.5 kg
Ice	2.5 kg
Yes Group Ham Sausage Seasoning	Unit 1.05 kg

Grinding and Mixing

Grind the fine mix along with the ham seasoning unit through a 1/8" (3 m) plate twice or until it is a very fine mixture. Grind the coarse mix through a 1" (26mm) plate. Transfer both to a mixer, mixing just long enough to get complete uniformity.

Stuffing

Stuff into well-flushed medium to large hog casings (35/38, 38/42) and hang well-spaced onto smoke sticks.

Smoking

In a conventional smokehouse, dry casings until tacky with smoke off and drafts open. Then cook for 2 hours at 140˚ F (60˚ C) with drafts closed and smoke on. Raise temperature to 170˚F (77˚ C) and cook for 1 1/2 hours or until internal temperature measures 160˚F (71˚C). Remove from smokehouse and chill in cold water to 105˚F (40˚ C) and allow to dry at room temperature for 2 hours. Place in 32 to 35˚ F (0˚ to 2˚C) cooler. Product is ready for sale. It should be refrigerated until sold.

Italian Fresh Sausage

Pork Butts, boneless	22.68 kg
Crushed Ice	500 g
Yes Group Italian Sausage Seasoning (mild, medium, hot, extra-hot)	Unit 500 g

Grinding and Mixing

Chill meats thoroughly 28 to 32˚F (-2 to 0˚ C) and grind through a 1/3" (8 mm) plate. Place in mixer along with ice and seasoning unit. Mix thoroughly but do not over mix as this will smear the sausage. Regrind through a 1/2" (12 mm) plate.

Stuffing

Stuff into well-flushed small hog casings (32/35, 29/32). Link the sausage into small links and place on a styrofoam or metal tray and place the tray into the cooler for one hour to set the colour of the sausage. Transfer the product from the cooler to the display case.

Cooking

Pre-steam with water then pan fry until golden brown in colour. This fresh sausage of Italian origin is seasoned with a variety of spices, including black pepper and fennel. The main difference in flavours from mild to extra hot is the addition of crushed chilies/cayenne pepper to the hotter sausages. True Italian fresh sausage should be made with no binders and sold in natural hog casings.

Garlic Sausage

Regular trimmings, boneless	7.68 kg
Lean trimmings, boneless	9.0 kg
Ice and water mix	4.0 kg
Yes Group Garlic Seasoning	Unit 2.0 kg

Grinding and Mixing
Chill meats thoroughly 28 to 32˚F (-2 to 0˚ C) and grind the lean trim through 1/2" (12 mm) plate and the regular trim through a 1/8" (3 mm) plate. Place in mixer along with i ice, water, and seasoning unit. Mix thoroughly for approximately 3 minutes.

Stuffing
Stuff into well-flushed medium to large hog casings (35/38, 38/42) and hang well spaced onto smoke-sticks.

Smoking
In a conventional smokehouse dry casings until tacky with smoke off and drafts open and then cook for 2 hours at 150˚F (66˚C) with drafts closed and smoke on. Raise temperature to 170˚F (77˚C) and cook for 1 hour or until internal temperature of 160˚F (71˚C) has been reached. Remove from smokehouse and chill in cold water to 95˚F (35˚C) and allow to dry at room temperature. Place in 32 to 35˚ (0˚ to 2˚C) cooler. Product is ready for sale. It should be refrigerated until sold.

Smoked Sausage (Smokies)

Regular Trimmings	13.5 kg
Lean Trimmings	9.0 kg
Ice and water	4.08 kg
Yes Group Smokie Seasoning	1.77 kg

Grinding and Mixing
Chill meats thoroughly 28 to 32˚F (-2 to 0˚ C) and grind through 1/4" (6 mm) plate. Place in mixer along with ice and seasoning unit. Mix thoroughly but do not over mix. Regrind through a 1/8" (3 mm) plate.

Stuffing
Stuff into well-flushed medium hog casings (32/35, 35/38) and hang well spaced onto smoke sticks.

Cooking
In a conventional smokehouse, dry casings until tacky with smoke off, then smoke at a temperature of no more than 110˚F (43˚C) for 4 hours. Slowly raise the temperature to 170˚F (77˚ C), until internal temperature measures 160˚F (71˚C). Remove from smokehouse and chill in cold water to 95˚F (35˚C) and allow to dry at room temperature. Place in 32 to 35˚ F (0˚ to 2˚C) cooler. Product is ready for sale. It should be refrigerated until sold.

Pepperoni-Cooked

Regular Trimmings	7.0 kg
Lean Trimmings	4.5 kg
Beef, boneless	13.5 kg
Ice and water	5.0 kg
Yes Group Pepperoni Seasoning	2.55 kg

Grinding and Mixing

Chill meats thoroughly 28 to 32˚F (-2 to 0˚ C) and grind through 1/4" (6 mm) plate. Place in mixer along with ice and seasoning unit. Mix thoroughly but do not over mix. Regrind through a 1/8" (3 mm) plate.

Stuffing

Stuff into 22mm collagen casings and link 12 - 24" long. Hang on smoke sticks, well spaced and hang overnight in 40 to 45˚ F (4˚ C to 7˚ C) cooler.

Smoking

In a conventional smokehouse, cook at 125˚ F (52˚ C) with dampers open for approximately 20 minutes and smoke off until casings dry. Then cook for one hour at 140˚ F (60˚ C) with dampers 1/4 open and smoke on. Finish to internal temperature of 160˚ F (71˚ C) gradually increasing heat from 140˚ F to 170˚ F (60˚ C to 77˚ C) with dampers 1/4 open, smoke on. Cold shower to 95˚F (35˚C) and allow to dry at room temperature before placing in a cooler. Product is ready for sale. It should be refrigerated until sold.

Peppered Pork Jerky Meats

Pork Butts, boneless	22.68 kg
Water	5.0 kg
Yes Group Peppered Jerky Seasoning	Unit 1.10 kg

Procedure

First remove all fat, connective tissue and sinew from meat. Slice meat, approximately 1/8" (3mm) thick. Place sliced meat in brine made from unit and water and leave overnight to cure at a temperature of 40˚F (4˚C)

Smoking and Drying

Place sliced cured meat on racks in the smokehouse and cook for 2 hours at 120˚F (49˚C) with smoke on for 1 - 2 hours, depending upon flavor desired. Cut off smoke and continue to dry for 5 - 6 hours at 150˚F (66˚ C) until moisture is reduced to desired level.

Packaging

After product is dry, remove from racks and cut into strips or pieces. Pack in vacuum packaging or cellophane bags as trade demands.

This information is supplied for your experimental use and guide for test purposes. While it may meet your needs, no guarantees are assumed or implied.

Costing & Computers

Least Cost Formulations sound intimidating. However, it is no more difficult than doing a traditional cutting test on a side of pork or primal of beef. In a cutting test, you take a single piece of meat, break it down into a variety of retail cuts, add up the total of the sales and compare it to the total cost of the original piece. In Least Cost Formulations, you do the reverse, you total the cost of all the ingredients and compare that to the total sales of the final product. The magic in Least Cost Formulations occur when you create a series of tests to compare different formulations, such as using different trim specs to see which is the most cost effective. This doesn't mean creating a cheaper quality of sausage; it means creating the same quality with the most cost-effective methods. (See sample charts below).

Pure Pork Sausage Formulation Samples

Formulation One	**kg**
Shoulder Picnic, boneless	-
75% Pork Trim	31
50% Pork Trim	23
Jowls	19
Pork Head meat	-
Total Meats	**73**
Ice	20
Spice and salt	2.1
Rusk	5.6
Gross Weight	**100.7**

Formulation Two	**kg**
Shoulder Picnic, boneless	-
75% Pork Trim	36
50% Pork Trim	18
Jowls	-
Pork Head meat	15
Total Meats	**73**
Ice	20
Spice and salt	2.1
Rusk	5.6
Gross Weight	**100.7**

Source Rector Foods Manual

Computer spreadsheets make this job much easier. As well, they can be used on a regular basis to check whether your methods continue to be cost effective. You should have a library of formulations on file at all times. When prices change, it means simply going into the spreadsheet and updating those prices. Results will displayed instantly. If you are not comfortable using a computer, find someone who is, as it is an invaluable tool. You don't use your band saw to cut only one item, why only use your computer to do only book keeping.

ALBERTA PORK

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