MEATCUTTING WORKBOOK PART 2

Prepared under the direction of the

Statewide Educational Advisory Committee
for the Meatcutting Industry

and the

Bureau of Publications, California State
Department of Education

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Foreword

In the California apprenticeship programs, experience gained on the job is supplemented by classroom work that is closely related to the job. This balanced system of training enables the apprentice to learn the "why" as well as the "how" of the trade. Both types of training are required for advancement in today's competitive industries.

The job-related courses for the skilled trades are highly specialized, and adequate training materials are for the most part not available commercially. To meet this need, the Department of Education, in cooperation with labor and management, develops the required training materials and makes them available to you at cost. This workbook is an example. It was written to provide you with up-to-date information you must have to meet the growing technical demands of the meatcutting trade. Every effort has been made to make the workbook clear, comprehensive, and current.

I congratulate you on your choice of meatcutting as a career. The effort you put forth today to become a competent journey-level worker will bring you many rewards and satisfactions, and the benefits will extend also to your community. We need your skills and knowledge, and I wish you every success in your new venture.

Superintendent of Public Instruction

Preface

The California State Department of Education, through the Bureau of Publications, provides for the development of instructional materials for apprentices under provisions of the California Apprentice Labor Standards Act. These materials are developed through the cooperative efforts of the bureau and employer-employee groups representing apprenticeable trades.

Meatcutting Workbook, Part 2, which was first published in 1975, was planned and prepared under the direction of the Statewide Educational Advisory Committee for the Meatcutting Industry consisting of employee and employer representatives. The members of this committee were Anthony Aiello, San Francisco, Warren J. Auld, Upland; Jack G. Cyphers, Sacramento; Fred L. Feci, San Jose; Maurice Gettleman, Inglewood; Everett Matzen, San Francisco; Philip R. Melnick, Los Angeles; Arthur Meyer, San Diego; and Rosemary Mucklow, San Francisco. The original manuscript for the 1975 edition was written by Warren Auld, with assistance from Anthony Aiello.

Duane "Whitey" Ulrich, Artesia, coordinated revision activities for this 1982 edition for the educational advisory committee, and Bob Klingensmith, Publications Consultant, Apprenticeship, directed publications activities for the Bureau of Publications.

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This workbook is representative of the cooperative effort of labor, management, local schools, and the State Department of Education and is dedicated to excellence in the Meatcutting Industry.

THEODORE R. SMITH
Editor in Chief
Bureau of Publications

UNIT A Breaking and Cutting Meat

TOPIC 1 – BEEF

This topic, "Beef," is planned to provide answers to the following questions:

- What has been done to standardize the names of retail meat cuts?
- What impact do area preferences have on meatcutting?
- What methods of cutting beef are used in California?
- Why must the meatcutter be able to identify retail and wholesale cuts?

A number of styles are used throughout the United States to cut beef. The style known as the New York or Eastern is used in the Eastern Seaboard states. In the Midwest the Chicago style is the most popular method of cutting beef; and on the West Coast, meatcutters generally use both the so-called National style and the Chicago style. The National style, which was introduced by the National Live Stock and Meat Board, incorporates the best of the cutting styles used in all sections of the country.

In September, 1973, a voluntary system of names for retail meat cuts was published by the National Live Stock and Meat Board. This voluntary system is expected to break down the once rather rigid sectional preferences for certain cutting styles. Also, the movement of consumers and meat industry personnel from one section to another section of the country has helped to break down sectional preferences and to standardize names of meat cuts.

Customer Meat Preferences

Every meatcutter soon learns that the style of meat cutting is dictated by the preferences of the people living within the immediate area of his meat department. Customer preferences are usually influenced by the different seasons or holidays of the year. Cold weather generally stimulates demands for roasts and stews, while warm weather increases demands for steaks and chops. Also, the ethnic background of people may have an influence on the demand for certain types of meat.

Wholesale Meat Cuts

The meatcutter must be able to identify both retail and wholesale cuts if he intends to become a meat department manager or owner of a market. He must have this knowledge in order to purchase meats from the wholesaler and to fabricate retail cuts from wholesale cuts.

Forequarter

The wholesale cuts in the forequarter are the rib, plate, brisket, shank, and square chuck (Fig. A-1). A square chuck breaks down into the English cut, O bone, and chuck back.

Hindquarter

The wholesale cuts in the hindquarter are the round, flank, and loin (Fig. A-2). The loin is divided into a head loin and a short loin. It is a standard practice in California to leave one rib on the hindquarter and 12 ribs on the forequarter.

Fig. A-1. Removing the rib and plate from the cross cut chuck

Carcass charts should be used by the apprentice meatcutter to familiarize himself with the various cuts of beef. These charts can be obtained from the California Beef Council or the National Live Stock and Meat Board.

Fig. A-2. Beef hindquarters with tips removed and cuts made to separate the loins from the rounds.

Aging Wholesale Cuts

Some retail markets maintain aging plants in which various wholesale cuts are held for specified periods of time. Many customers prefer beef that has been aged because it tends to improve the tenderness and flavor of the meat. If the market where the apprentice meatcutter works maintains such a plant, he should learn all he can about the aging process. This information may be valuable later in helping him to serve his customers.

Business Relationships

The meatcutter must maintain good relationships not only with his customers but also with the wholesaler from whom he purchases his meat. The wise meatcutter knows that he may use the advice and services of the wholesaler and his representatives to good advantage in meeting the needs of his customers.

Study Assignment

1. John R. Romans and P. Thomas Ziegler, *The Meat We Eat* (Tenth edition). Danville, Ill.: The Interstate Printers & Publishers, Inc., 1974. Read pp. 439–87 and 719–22.
2. *Meat Buyer's Guide to Standardized Meat Cuts* (Twelth printing). Prepared by the National Association of Meat Purveyors. Chicago, 1972. Read pp. 5–51.
3. *Lessons on Meat* (Second edition). Prepared by the National Live Stock and Meat Board. Chicago, 1970. Read pp. 3–7 and 36–46.

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 1 – BEEF.

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The two styles of meatcutting generally used on the West Coast are the 1 style and the 2 style. — 1. _____ 2. _____

2. Lean meat has a higher 3 content than meat with very little 4. — 3. _____ 4. _____

3. The so-called tight side of a beef carcass is the 5 side. — 5. _____

4. Three cuts usually obtained from the standing rib are the 6 roast, 7 steak, and 8 steak. — 6. _____ 7. _____ 8. _____

5. The diaphragm muscle on the inside of the forequarter is called the 9 steak. — 9. _____

6. When a chuck is boned and divided into top and bottom chuck by the National style of cutting, the division is made along the 10 bone. — 10. _____

7. The aitchbone is located in the 11. — 11. _____

8. Customer preferences are usually influenced by their 12 background as well as the 13 and 14 seasons. — 12. _____ 13. _____ 14. _____

9. The main purpose of aging meat is to improve its 15 and 16. — 15. _____ 16. _____

10. In California the forequarter is generally divided into the 17, 18, 19, 20, and 21. — 17. _____ 18. _____ 19. _____ 20. _____ 21. _____

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 2 – PORK

This topic, "Pork," is planned to provide answers to the following questions:

- How does pork compare with other meats in value?
- Why do some areas of the country use more pork than other areas?
- Why is pork more dependable for tenderness than other meats?

Breaking and Cutting Pork

Practically all pork is sold by the packing plant as cuts rather than by the quarter, side, or carcass. About 20 percent of the cuts are sold fresh, and the remaining 80 percent are cured, rendered into lard, or manufactured into meat products.

Pork is broken down into fewer grades than beef, veal, or lamb because it comes from young animals and is always tender. Also, pork is marketed primarily by cuts because it spoils much faster than other kinds of meat. A surplus of pork on hand could be very costly for the market operator if it is not sold within a reasonable period of time.

The retail meatcutter seldom breaks pork into primal cuts. However, on rare occasions he may be called upon to fabricate cuts from a pork carcass, and he must know how to perform this task. The meatcutter should, therefore, be familiar with the latest techniques for breaking a pork carcass into retail cuts.

Pork Facts

Pork is more tender overall than most meats because hogs are marketed young (6 to 12 months) and fat. Hogs are fattened as they grow and until they are sent to the packing plant. Pork is available in three grades: U.S. 1, U.S. 2, and U.S. 3. Grading is based on conformation, finish, and quality.

Meat from all animals, including pork, is almost completely digested. The old wives tale that "pork is hard to digest" was proved to be erroneous long ago by food studies involving man as well as experimental animals. The proteins from meat are at least 97 percent digested, and meat fat is at least 96 percent digested.

Pork is one of the better profit items in the meat market. The profit conscious meat operator should give pork a good spread in the display case to increase his profit margin.

Pork Production

Hogs are an excellent source of meat because of their ability to reproduce. Good quality and conformation go along with good flavor. Since they reproduce at a very rapid rate, hogs can be quickly improved by selective breeding. A sow matures at an early age and usually has her first litter before she is a year old. A good sow may have two litters a year and raise an average of eight or more pigs to a litter. If hogs are fed and cared for properly, they will weigh 200 pounds when they are ready for market at six months of age.

Study Assignment

1. John R. Romans and P. Thomas Ziegler, *The Meat We Eat.* Read pp. 383–438.
2. *Meat Buyers Guide to Standardized Meat Cuts.* Prepared by the National Association of Meat Purveyors. Read pp. 77–84.
3. *Lessons on Meat.* Prepared by the National Live Stock and Meat Board. Read pp. 27, 33–48.

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 2 – PORK

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Most pork sold in retail markets comes from animals that are __1__ to __2__ months old. 1._____ 2._____

2. The average bacon yield from a hog carcass of 220 to 250 pounds ranges from __3__ to __4__ pounds. 3._____ 4._____

3. The picnic shoulder is also known as the __5__. 5._____

4. Canadian style bacon is cut from the __6__ of the carcass. 6._____

5. A pork carcass should be chilled at a temperature of __7__ to __8__ for __9__ hours before it is broken down into cuts. 7._____ 8._____ 9._____

6. Fresh trimmed jowls are known as __10__ __11__. 10._____ 11._____

7. Unlike beef, veal, and lamb, most pork does not leave the packing plant in the __12__ form. 12._____

8. Ham represents __13__ to __14__ percent of the weight of a skinned carcass. 13._____ 14._____

9. The pork head is used to make __15__ __16__ or __17__. 15._____ 16._____ 17._____

10. Pork is broken down into fewer grades because it comes from __18__ animals and is always __19__. 18._____ 19._____

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 3 – LAMB AND MUTTON

This topic, "Lamb and Mutton," is planned to provide answers to the following questions:

- Why is the demand for lamb expected to increase in the future?
- How can the demand for lamb be improved?
- What is the difference between lamb and mutton?
- What type of lamb is the best eating?
- How does lamb rank in terms of food value and profit?

Although lamb is a good profit meat, sales have not kept pace with the sales of other kinds of meat for many years. However, food experts expect lamb sales to improve in the future because of the increase in demand for all kinds of meat throughout the world.

Lamb and mutton account for approximately 4 percent of the 21 billion or more pounds of meat consumed annually in this country. About 10 percent of the ovine consumption is mutton and 90 percent is lamb. Many leaders in animal production believe that the production of lamb and mutton can be increased by new and improved methods of producing, distributing, and promoting the consumption of these meats. The California Lamb Council conducts advertising and promotional campaigns to get the word "lamb" before the customers. The meatcutter can also do his share in promoting lamb by having good, bright, and attractive displays.

Lamb and Mutton Classifications

Sheep carcasses are divided into two main groups that are based on age – lamb and mutton. As with pork, age and not sex classes is very important to the eating quality of lamb. Because the animals mature when they are between 12 and 14 months old, the change in character of the meat resulting from age – change from lamb to mutton – then takes place.

Classes of Lamb

Lamb can be identified by the break joint that is located on the lower foreshank. In a lamb the leg can be broken at this joint in such a way that four well-defined ridges will remain. The ridges are not sharp but are fairly smooth, moist, and red with blood.

Hothouse lamb. Hothouse lambs are marketed when they are two to four months of age. These lambs are raised under artificial conditions indoors and are dressed with the pelts on to hold the blood and prevent excessive shrinkage of the carcass. Hothouse lambs are in demand mainly during Christmas and Easter holidays.

Genuine spring lamb. Lamb at the age of three to five months is the best eating. The meat is light pink and tender.

Spring lamb. This lamb is tasty but not as tender as the genuine spring lamb. It is usually from five to eight months old.

Lamb. Lamb is fat and heavy and not as tender as the other three classes. It is from 8 to 12 months old.

Classes of Mutton

Sex is an important distinction in the classes of mutton. With mutton the break will have to be made at the fetlock, or round joint, which is just below the true break joint. All mutton has a larger proportion of fat, is more firm, and has darker meat than lamb.

Yearling. The yearling sheep is 12 to 20 months of age. It is larger than lamb and has a wider abdominal cavity, whiter color of the break joint, and darker red color of the outside musele covering the flank and rib.

Wether. The wether is a mature sheep that was castrated as a young lamb. It has a large supply of cod fat, a more regular conformation, a higher percent of flesh, and smaller forequarter in relation to hindquarter.

Ewe mutton. Ewes are female sheep that are at least 20 months old at the time of slaughter and have given birth to lambs. They have large middles and small necks and shanks.

Buck mutton. Bucks are male sheep that have never been castrated and are more than two years old. The carcass is short and has large bones and dark flesh.

Lamb Facts

In California the fell is usually removed before the rib chops, small loin chops, and sirloin chops are cut so that it can be stripped in one piece (Fig. A-3). The knife is inserted at the front of the lamb rack or double loin, and a cut is made that is only long enough to get the fell started. The fell is then stripped from the front to the back.

A recommended method for cutting lamb rib chops, small loin chops, and sirloin chops is to cut through the meat with a knife and saw the bone with the proper saw.

Many new methods of merchandising lamb have been introduced. These methods have made the sliced and tied shoulder roast a popular item and stimulated the use of boned and rolled legs and shoulder for the barbecue and shishkabob. They have caused specialty items such as lamb riblets, lamb breast for stuffing, ground lamb patties, and lamburger to be made available. The demand for small legs of lamb has been met in some instances by cutting large legs of lamb into halves.

Study Assignment

1. John R. Romans and P. Thomas Ziegler, *The Meat We Eat.* Read pp. 489–526.
2. *Meat Buyer's Guide to Standardized Meat Cuts.* Prepared by the National Association of Meat Purveyors. Read pp. 53–63.
3. *Lessons on Meat.* Prepared by the National Live Stock and Meat Board. Read pp. 27, 33–48.

Fig. A-3. Breaking a whole lamb

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 3 – LAMB AND MUTTON

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Of all the lamb and mutton sold in the United States, approximately __1__ percent is lamb. 1. _____

2. The foresaddle includes the first rib through the __2__ rib. 2. _____

3. The most reliable guide to use in determining the age of lamb or mutton carcasses is the __3__ __4__. 3. _____ 4. _____

4. English chops are fabricated from the wholesale cut called the __5__. 5. _____

5. When a leg of lamb is prepared by removing the shank meat at the stifle joint, tucking the meat into the pocket under the fell, and pinning it into place, the cut is called the __6__ leg. 6. _____

6. Lambs that are in the greatest demand will produce carcasses that weigh from __7__ to __8__ pounds. 7. _____ 8. _____

7. Sheep __9__ months or more of age are the source of mutton. 9. _____

8. Fell is stripped from the lamb rack starting at the __10__. 10. _____

9. Lamb is more plentiful in the meat market in the __11__ and __12__ seasons. 11. _____ 12. _____

10. The change in classification from lamb to mutton occurs when the animals are __13__ to __14__ months old. 13. _____ 14. _____

TOPIC 4 – VEAL

This topic, "Veal," is planned to provide answers to the following questions:

- Why is veal consumption low in the United States?
- Why is veal difficult to cut?
- What effect does aging have on veal?
- What is the difference between vealers and calves?

The meat industry has not promoted veal to any great extent; therefore, it is not as popular as other meats. Veal can be an important sales item because it cannot be purchased in many markets. However, veal cannot be displayed or stored for any great length of time after it has been received from the wholesaler because it has very little fat, has a high moisture content, and does not lend itself to aging.

Retail veal cuts are generally one-third to one-half as large as the same cuts of beef. Cutting veal or calf is more difficult than cutting beef because of the softer texture of the meat. The meatcutter, therefore, should take special care in cutting and preparing veal retail cuts.

Veal and Calf Carcass

The value and grade of a vealer or calf carcass depends upon finish, weight, quality, and form. Good conformation or form requires a broad, compact body with full thickness throughout the carcass. The legs, loins, and ribs provide the most valuable cuts, so good conformation is especially important in these parts. A heavy breast–sharp, angular back and long shanks and neck are faults of form and are usually undesirable.

Veal quality can be distinguished readily. The best grades have a finely grained flesh that is light pink in color and is smooth and firm. The bone usually shows some blood and is soft.

Milk Calves

The so-called "milk calves" are vealers that have been left with their mothers up until the time they are taken to be slaughtered. Because they have been fed mostly with milk, their flesh is rich, firm, finely textured, and bright pink in color. The carcasses of milk calves generally are cut by one of two methods. Either the flesh is cut with a knife and the bone is cut with a power saw, or the carcass is frozen almost solid and both the meat and bone are cut with a power saw in the same manner as beef.

Westerns and Kips

The "grass calves" or "westerns," on the other hand, are weaned early and then pastured to feed on grass. They have red, beefy colored meat. As these calves get heavier, they become known as "kips" or heavy calves. Actually, they are larger and fleshier than calves, but they have not quite reached baby beef size. A top grade kip tends to show some fat.

Veal Demand

The demand for meat from each of the classes of calves varies throughout the country. This variation is caused partly by the difference in climatic conditions and partly by the different ethnic backgrounds of the people. In certain areas people pay very little attention to the color of meat, while in other areas they demand meat of a specific color.

A number of possibilities exist for combining veal with other meats to make a marketable product. For example, veal and calf may be used as filler in chicken loaf, chicken salad, and turkey salad. A good meat loaf may be made of 80 percent veal and 20 percent pork. Veal may be ground by itself and marketed as ground veal, or it may be combined in varying proportions of pork or lamb and ground to produce a meat loaf mix.

Boneless veal cuts have a growing market. A large proportion of the cuts from the forequarters of veal carcasses weighing less than 50 pounds are boned and rolled. This practice is liked by most meatcutters because it is very difficult to make presentable retail cuts from small carcasses.

Study Assignment

1. John R. Romans and P. Thomas Ziegler, *The Meat We Eat.* Read pp. 527–30.
2. *Meat Buyer's Guide to Standardized Meat Cuts.* Prepared by the National Association of Meat Purveyors. Read pp. 65–75.
3. *Lessons on Meat.* Prepared by the National Live Stock and Meat Board. Read pp. 10, 11, and 47.

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 4 – VEAL

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Retail veal cuts average about one-third to __1__ - __2__ the size of comparable cuts of beef. 1._____ 2._____

2. The heavier western calves are known as __3__ __4__. 3._____ 4._____

3. A retail cut known as the kidney chop comes from the wholesale cut called the __5__. 5._____

4. Two unsplit hindquarters with the loin and nine ribs attached form the wholesale cut known as the __6__ __7__. 6._____ 7._____

5. Veal has very little protective __8__ covering, is high in __9__, and does not lend itself to __10__. 8._____ 9._____ 10._____

6. The style used most often for cutting veal is the __11__ style. 11._____

7. Chops made from the fourth, fifth, and sixth ribs are called __12__ veal chops. 12._____

8. Veal and __13__ are usually combined and ground together to make the so-called veal loaf. 13._____

9. Veal sirloin steak is also known as sirloin veal __14__. 14._____

10. The veal leg with the rump removed represents about __15__ percent of the carcass weight. 15._____

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 5 – GROUND BEEF, CUBED MEAT, AND MEAT ADDITIVES

This topic, "Ground Beef, Cubed Meat, and Meat Additives," is planned to provide answers to the following questions:

- Why is ground beef the most important sale item in the meat market?
- What important factors must be considered in making quality ground beef?
- What are the advantages of producing cubed meats?
- What are meat additives, and how and why are they used?
- What purchase specifications are used for ground and cubed meats?

Ground beef is one of the most popular meat items in the display case and generally accounts for a considerable portion of the meat department's sales. To succeed in the retail meat business, the apprentice meatcutter must be able to grind meat properly and to make the best use of beef trimmings in ground beef.

Every market has cuts of beef that lose their attractiveness, either through handling or lack of sales. Rather than leave these cuts of meat on display, the meatcutter should convert them into meat items that are always in demand. If the meatcutter follows this practice, shopworn cuts, odds and ends of cuts, and the trimmings may be made into profitable products. Grinding the less desirable cuts with the proper amount of fat and boneless lean meat produces a finished product that sells readily at a profitable price.

Most meat markets sell three types of ground beef: ground round, ground chuck, and so-called ground beef. However, because of new regulations regarding the labeling of ground meat, markets are using more descriptive names: lean ground beef, super lean ground beef, and regular ground beef. These names indicate the fat content of the ground meat.

A cubing machine may be used to convert rough and ragged but tender pieces of steak into eye-appealing steaks that provide a good profit. However, meat that contains a large amount of connective tissue is not made tender by putting it through this machine. The use of the cubing machine should be restricted to tender cuts of meat if it is to be used to the best advantage.

Ground Beef

Grinding beef, perhaps one of the most important processes carried on by a retail market, requires utmost precaution at all times. The meatcutter should know and observe the federal and state laws pertaining to ground meat. He should always use fresh meat and grind only as much meat as he can sell before it loses its fresh color. He should also know the qualities that make ground beef marketable. A bright red product with a lean look sells readily, and its price is often only a secondary consideration. However, it is also true that ground beef made of very lean meat will dry out when it is fried or broiled.

Most ground meat is put through the grinder twice, first through the coarse plate and then through the fine plate (Fig. A-4). The meat should not be pushed into the hopper of the grinder with the hand, a stomper should always be used for this purpose. The blades of the grinder should be kept sharp, and the hopper should be kept cold. A warm hopper and dull blades give ground meat a grayish

Fig. A-4. Running ground beef through the fine grind

look and make it appear extremely fat, a cold hopper and sharp blades give ground meat a red and appetizing look. Cold meat should be pushed into the hopper and through the machine as fast as possible to keep it from warming up too rapidly. This procedure will give the ground meat more of a reddish look, as well as bloom, and slow down the rate of spoilage.

Meat should be fed into the grinder in fairly small amounts. Forcing large quantities of meat into the throat will cause air pressure to build up within the grinder.

The grinder should be kept clean at all times. Meat left in the grooves of the hopper may taint the meat being ground and cause it to be unfit for consumption. Even after the first grinding, when the plates are being changed for the second grinding, the meatcutter should remove the sinew and bits of bone that accumulate around the knife. If bits of meat prevent the knife from coming into direct contact with the plate and from cutting with a shearing action, the knife will tend to squeeze meat through the plate, resulting in a mushy, poorly ground product. When this condition occurs, the ring, plate, and knife should be removed and cleaned thoroughly.

The ring on the grinder head should be tightened with the hand only. Do not use a wrench or other tools. Tools usually create too much tension, which will cause excessive wearing and heating of the knife and plate.

Many markets grind beef for display in several ways. For example, they may make rosettes, or they may put up flat grooved displays in one and two pound packages, or they may prepare different size patties with ground meat patty machines.

Ground Beef Specifications

The Institutional Meat Purchase Specifications (IMPS) describe two types of ground beef patties: (1) item No. 1,136–ground beef patties, regular, which are prepared from item No. 136–ground beef, regular; and (2) item No. 1,137–ground beef patties, special, which are prepared from item No. 137–ground beef, special. Specifications for ground beef item No. 137 are found in reference Series 100.

Regular ground beef. Regular ground beef may be prepared from trimmings that are normally produced in commercial boning of beef, including meat from shanks, flanks, skirts, and hanging tenderloins. Meat from heads, gullets, tongues, hearts, glands, or added fat, such as suet, cod, heart fat, and the like, is not permissible. The fat content of ground beef must be determined visually prior to grinding and must not exceed 25 percent.

The meat must be made completely boneless, and all cartilage, backstrap, fibrous tissue, bone slivers, serous membranes, and neck meat with dark red discoloration must be removed.

The prepared beef must be thoroughly blended prior to and after initial grinding to uniformly distribute lean and fat portions. Initial grinding should be through a plate having holes no larger than 1 inch in diameter (or it may be otherwise reduced in size, provided the texture and appearance of the product after final grinding is typical of ground beef prepared by grinding only). Subsequent to initial grinding, the product must be ground once through a plate having holes ⅛ inch in diameter.

Special ground beef. Special ground beef must be produced from fresh chilled carcasses or cuts. If cuts are used, the product must consist of no less than 50 percent primal beef cuts; that is, any one or more of square-cut chucks, ribs, short loins, loin ends, or rounds. The remaining 50 percent or less may consist of flanks, briskets, navels, or shanks.

Meat Additives

With the introduction of meat additives to ground beef, a new set of standards was enforced. These standards include requirements for labeling, cooking, ingredients, and raw materials.

Meat additives have been used in meat products for some time in the form of flours, starches, and milk solids. The most recent additives are in the form of manufactured soy protein isolate, soy grits or soy flour, and soy protein concentrate.

The United States Food and Drug Administration has defined these products by specifications as follows:

1. *Soy protein concentrate.* Soy protein concentrate is prepared from high quality, sound, clean, dehulled soybeans by removing most of the oil and water soluble nonprotein components. It must contain not less than 70 percent protein (Nx 6.25) on a moisture free basis.
2. *Soy protein isolate.* Soy protein isolate is a major proteinaceous fraction of soybeans that is prepared from high quality, sound, clean, dehulled soybeans by removing a preponderance of the nonprotein components. It must contain not less than 90 percent protein (Nx 6.25) on a moisture free basis.

3. *Soy grits or soy flour.* This mechanically classified product is obtained from high quality, sound, clean, dehulled soybeans. It must be moisture free and have a protein content in the range of 40 to 60 percent, (Nx 6.25) fiber maximum of 3.5 percent, and a variable fat content.

The basic difference between the three additives is the amount of protein each contains, which is measured in percent. Soy grits or soy flour contains 40 to 60 percent protein; soy protein concentrate contains not less than 70 percent protein; and isolated soy protein contains not less than 90 percent protein. In short, the name of the soy product is an indication of the protein content. These products are manufactured by various companies under different trade names, some of which are already included in ground meat in a form which needs only to be added to water or sauce to make a meat sauce or meat loaf. Some of these products also contain fillers and binders in addition to the soy products. These products are all controlled by the standards of the U.S. Food and Drug Administration.

When any soy products are added to ground meat, they are first reconstituted with water to enhance the mixing. Soy products are often sold with seasonings and flavorings included in the additive.

Taste tests conducted at the 1973 Meat Processing Conference at the University of California at Davis showed that a low-temperature chop patty containing 17 percent soy received the highest score, indicating the good eating and taste qualities of patties containing soy protein. The results of these tests were in general agreement with tests conducted the previous year. If these tests are any indication, soy products will probably be used in more ground meat products in the future. It must be noted, however, that even though the 17 percent soy patty scored high on the taste test, the 30 percent soy patty scored low. This may indicate that soy must be controlled to produce a high quality product with a desirable taste. It is also possible that ground meat with a high percentage of soy would be less expensive than a product with very little soy or even an all beef patty.

Cubed Meats

A number of electrically powered machines are available for cubing meat. These machines were originally developed for cubing beef but have been used more and more for pork and veal meats. The cubing machine, like the grinder, should be kept clean at all times.

One of the greatest advantages of the cubing machine is that it can be used to convert many small pieces of meat into a salable product. These pieces of meat are usually not large enough to be sold separately and are too tender to be marketed as stew meat. The cubing machine will take several of the little pieces of meat and knead them into larger individual pieces.

Also, during sales of special cuts, such as round steak or flank steak, the meatcutter can often increase his sales volume by using the cubing machine. Both round steaks and flank steaks, for example, may be cubed for Swiss steak.

The IMPS state that cubed steak (items No. 1,100 and No. 1,101) may be produced from any boneless meat from the beef carcass that is reasonably free of membranous tissue, tendons, and ligaments. The meat must be made into cubed steaks with machines designed for this purpose. Knitting and folding two pieces of meat when cubing is permissible. Cubed steaks must be reasonably uniform, and surface fat on the edge after cubing should not exceed ½ inch in width at any one point when measured from the edge of the lean. Surface and seam fat must not cover more than 15 percent of the total area of either side of the cubed steak. The cubed steak must not break when suspended from any point ½ inch from the outer edge of the steak.

Chemical Additives

Chemical additives are used in meat for many reasons, most of them for protection of the consumer, and a few for the producer who is concerned with increasing the shelf life of the product. Additives are edible substances, such as spices, condiments, binders, extenders or curing agents, used in food mixtures for flavor, palatability, and preservation. Some of the more well-known chemical additives and their uses are as follows:

1. *Ascorbic acid.* Ascorbic acid is a white, colorless, crystalline compound present in fresh fruits, particularly citrus fruits, and vegetables such as tomatoes, potatoes, and so forth. It is used to accelerate the color fixation of cured meats.
2. *Monosodium glutamate.* Monosodium glutamate, also known under the trade name as MSG, is derived from wheat gluten and sugar. The compound has very little flavor

but is known for bringing out the flavor of other foods.

3. *Sulfurous acid.* This additive is used as a preservative in the form of sulfite of sodium, calcium, or potassium. It is used to inhibit the growth of yeasts, molds, and aerobic bacteria. Sulfites are banned in California because they are sometimes used to disguise putrefied meat; they restore the bright color to dark meat.
4. *Nitrates and nitrites.* Nitrates and nitrites are used to produce a bright red color in cured meats and to inhibit the growth of clostridium botulinum.
5. *Sorbic acid.* Sorbic acid is a fungistatic agent used to treat food wrappers to increase shelf life. This additive has a tendency to impart an undesirable flavor and odor.
6. *Other additives.* Although they are not necessarily chemicals, other additives besides salts are used in meats. Sugars and sugar derivatives such as dextrose, corn syrup, sucrose, and sorbitol are used mainly in the production of semidry and dry sausages and cured meats.

Study Assignment

Institutional Meat Purchase Specifications–Series 1000. Washington, D.C.: U.S. Department of Agriculture, Consumer and Marketing Service, Livestock Division, 1970. Read sections assigned by the instructor.

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 5 – GROUND BEEF, CUBED MEAT, AND MEAT ADDITIVES

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Most ground meat is put through the grinder twice, first through the 1 plate and then through the 2 plate. — 1._____ 2._____

2. A 3 rather than the hand should be used to feed meat into the 4 of the grinder. — 3._____ 4._____

3. Manufactured soy concentrate is another form of meat 5 which contains 6 . — 5._____ 6._____

4. Ground meat usually has a grayish appearance when it is put into a grinder with a 7 hopper and 8 blades. — 7._____ 8._____

5. One of the greatest advantages of the cubing machine is that it can be used to convert 9 pieces of meat into a 10 product. — 9._____ 10._____

6. Chemical additives are used in meat to 11 the consumer and to increase the 12 13 of the product. — 11._____ 12._____ 13._____

7. According to the IMPS, ground beef may be produced from any 14 meat from the beef carcass which is reasonably free from membranous 15 , 16 , and ligaments. — 14._____ 15._____ 16._____

8. Ragged, rough cuts of lean beef can be sold more profitably as 17 18 than as ground beef. — 17._____ 18._____

9. Soy protein additives are prepared from sound, clean, dehulled 19 . — 19._____

10. If the ring on the grinder is tightened too much, it will cause excessive 20 and 21 of the grinder. — 20._____ 21._____

UNIT A – BREAKING AND CUTTING MEATS

TOPIC 6 – VARIETY MEATS

This topic, "Variety Meats," is planned to provide answers to the following questions:

- What are variety meats?
- What kind of customer buys variety meats?
- What is the nutritive value of variety meats?

The inedible by-products of the meat industry, which include such products as gland extracts, hides, soap, glue, and gelatin, were discussed earlier in the course. This topic deals with the edible by-products that are generally grouped under the name of variety meats.

Variety meats, which are often referred to as "offal," usually include the brains, tongue, heart, tripe, kidneys, and liver. The edible glands, called sweetbreads, are the thymus glands of young beef, calves, and lambs. The sweetbreads are the most expensive kind of variety meats.

Modern display cases and improved display methods have increased the demand for variety meats. The nutritive value of these meats has long been known by the homemaker, who is discovering that these meats are delicacies when they are prepared properly.

Variety meats can also be highly profitable to the meatcutter, perhaps the most profitable of any meat item he sells in the market. This is often true even though he has a low volume of sales. The meatcutter who sells variety meats gives the customer the impression that his market carries all kinds of meat. Some variety meats sell in every neighborhood, while only certain items may be in demand in other neighborhoods. Also, people who do not eat variety meats will often buy them for pet foods.

Study Assignment

1. John R. Romans and P. Thomas Ziegler, *The Meat We Eat.* Read pp. 663–742.
2. *Lessons on Meat.* Prepared by the National Live Stock and Meat Board. Read pp. 15, 20, 23, 26, 30, 74, and 75.

UNIT A – BREAKING AND CUTTING MEATS

TOPIC 6 – VARIETY MEATS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The edible glands known as sweetbreads are the _1_ glands of young beef, calves, and lambs. 1._____
2. Tripe is the inner lining of the _2_ in beef. 2._____
3. Of the edible livers, the one with the highest iron content is that of _3_. 3._____
4. The _4_ and _5_ are the toughest of all the variety meats. 4._____ 5._____
5. Sweetbreads or thymus glands are the most _6_ edible meat by-products. 6._____

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 7 – POULTRY AND RABBITS

This topic, "Poultry and Rabbits," is planned to answer the following questions.

- Why has poultry become one of the most popular meat items?
- What cutting style is used to fabricate chicken parts in California?
- What is the most popular method for cutting up rabbit?

Poultry has become one of the most popular meat items in the country because of its general acceptance by the public, the many ways it can be prepared, and its availability during all seasons of the year. In fact it has become so popular that the total tonnage of chicken sold annually exceeds that of veal and lamb and is approaching that of pork.

Poultry

Chicken and turkey account for most of the poultry sold in the meat market. The chicken's ability to reproduce and its reasonable selling price make it a good profit item. Although turkey is more in demand during the holiday seasons, the consumer is finding new uses for it in his daily diet.

Chicken

The dressed chicken sold in the retail stores can be divided into five major groups: broiler, fryer, roaster, fowl, and pullet.

Broiler. The broiler is a two to three month old chicken that weighs from 1 to 1½ pounds. It is served either in the half or the whole form.

Fryer. A fryer is a chicken of either sex that weighs from 2 to 3 pounds. The size of a three to four month old bird makes it desirable for frying in pieces.

Roaster. A roaster is generally a quick-grown, forced-fed cockerel that weighs 3 to 6 pounds. Large amounts of dressing can be stuffed into the body cavity of this bird.

Fowl. A fowl is a female chicken that is no longer a productive layer, usually heavily fatted, and not very tender. It is used in dishes that require prolonged cooking.

Pullet. A pullet is a young female chicken that has not yet or has just started egg production. It is usually less than a year old and may be used as a roaster or as a fowl.

Turkey

The dressed turkey sold in retail markets can be divided into four major groups. young turkey, yearling turkey, breeder turkey, and fryer turkey.

Young turkey. This bird is either a soft-meated hen or tom turkey that is less than a year old.

Yearling turkey. A yearling turkey is a heavy-breasted, one year old tom that is not as tender as the young tom.

Breeder turkey. A breeder turkey is a mature hen or tom with hardened meat and keelbones. This bird is more than a year old, has less flavor, and requires a longer cooking time.

Fryer turkey. Any turkey weighing up to eight pounds.

Other Poultry

Other types of poultry include ducks, geese, guinea, fowl, pheasants, squabs, and cornish hens, which are particularly plentiful during the holiday seasons. They are generally sold in the frozen form with or without stuffing, while some are precooked.

Cutting and Packaging Poultry

One rule the meat retailer should never forget is that he must offer poultry in prime condition and in an eye-appealing display if he is to get the best price (Fig. A-5).

In California, the meatcutter must comply with poultry inspection laws that regulate the cutting of poultry. Most markets find it necessary to use a knife for the cutting operation in order to fabricate parts defined by the laws (Fig. A-5).

The packaging of parts, such as legs, thighs, wings, and (for turkey) rolled breasts, has become increasingly popular for both chickens and turkeys.

Boneless chickens and rolled boneless turkeys are also appearing on the market. Rolled boneless turkeys are usually prepared by the processor. Markets are also selling half and quarter turkeys for small families.

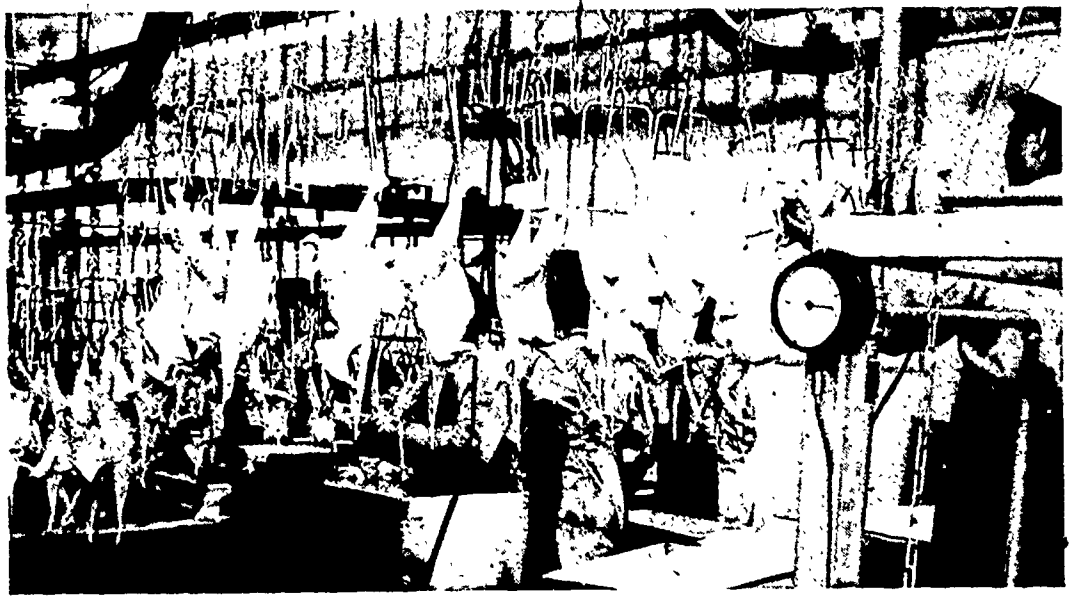
Rabbits

Rabbit, which is frequently grouped with poultry, is becoming increasingly important as a source of meat for restaurants and the home. Rabbit may be cut up with a power saw in very little time. Before the cutting is done, however, the

liver should be removed. One popular method of cutting is as follows. lay the carcass crosswise on one side with the back toward the blade and make three cuts with the power saw. The first cut, which is made just in back of the front legs, severs both the front legs and part of the rib section from the rest of the carcass. The second cut is made just in front of the back legs to sever both back legs from the back, which is left in one piece. The third cut is made just deep enough at the center of the back to go through the backbone. In the final steps, the foresection is split and the back legs are separated.

Study Assignment

John R. Romans and P. Thomas Ziegler, *The Meat We Eat.* Read pp. 192–208, 606, 668–82.



Removing entrails

Wrapping and replacing giblets

Boxing whole chickens

Fig. A-5. Poultry plant operations

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 7 – POULTRY AND RABBITS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The four major groups of dressed chickens sold in retail stores are 1, 2, 3, and 4. — 1. ____ 2. ____ 3. ____ 4. ____

2. Before a rabbit is cut up, the 5 should be removed. — 5. ____

3. Fryers are classed as young chickens that weigh from 6 to 7 pounds. — 6. ____ 7. ____

4. A young hen turkey is less than 8 9 old. — 8. ____ 9. ____

5. Birds that are to be frozen should be 10 11. — 10. ____ 11. ____

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 8 – FISH

This topic, "Fish," is planned to provide answers to the following questions:

- **What are two of the most common problems encountered in cooking fish?**
- **How are lean and fat fish cooked?**
- **How does fish compare with other meats from the standpoint of nutrition?**

Fish helps to provide variety in the daily menu. With approximately 240 species of fish and shellfish available on the market, a different kind of fish could be served every day for almost six months. Fish is comparable to other meats in food value. The average serving of fish is about one-third to one-half pound of edible flesh.

Cooking Problems

Two problems are usually encountered in cooking fish. The first problem is the tendency to overcook fish. Most fish will cook in 20 minutes or less. Overcooking takes much of the flavor and goodness out of fish.

The second problem is twofold. First, many customers not only lack the basic knowledge needed to cook fish but also are not familiar with the cooking techniques required to prepare the different types of fish. Second, the meatcutter is often unable to help the customer because he lacks the know-how for cooking the many kinds of fish he sells over the counter in his market.

Fish Cookery

Variety can be obtained by using different kinds of fish, different cooking methods, and delectable sauces and colorful garnishes. A few basic rules for fish cookery are as follows:

1. Fish should be handled as little as possible during cooking because it is tender and delicate.
2. Fish requires a relatively short cooking time and a moderate temperature. The length of cooking time will depend on the thickness of the fish.
3. Fish is not tough, but overcooking will make it dry and rubbery.
4. Fish is done when it is tender, separated from the bones, and flakes easily when tested with a fork.
5. Frozen fillets and steaks may be cooked without being thawed if additional cooking time is allowed.
6. Frozen fish should be thawed first when it is to be breaded, fried, or stuffed.

Fish Facts

Fish is an excellent source of protein, vitamins, and minerals (calcium and phosphorus). Iodine is obtained from marine fish, while vitamins A and D are provided by fat fish.

Fish is easily digested and readily assimilated by the human body. It is low in carbohydrates, sodium, and total fat. Fats in fish are soft or polyunsaturated. The fat fish (5 to 20 percent) include anchovies, herring, mackerel, salmon, sardines, trout, tuna, and catfish. Lean fish (under 5 percent) include cod, rock fish, flounder, halibut, ocean perch, sole, and white sea bass.

UNIT A – BREAKING AND CUTTING MEAT

TOPIC 8 – FISH

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Fish is an excellent source of __1__, __2__, __3__, and __4__.

1._____
2._____
3._____
4._____

2. A relatively short cooking __5__ and a moderate __6__ are required for preparing fish.

5._____
6._____

3. Fats in fish are __7__ or __8__.

7._____
8._____

4. Fish is easily __9__ and readily __10__ by the human body.

9._____
10._____

5. Fish is done when it is __11__, __12__ from the bones, and __13__ when tested with a fork.

11._____
12._____
13._____

UNIT B Jobbing

TOPIC 1 – DISTRIBUTION CHAIN

This topic, "Distribution Chain," is planned to provide answers to the following questions:

- **How is meat channelled to the various retail outlets?**
- **What are the functions of the different types of wholesale meat distributors?**
- **How does the present day meat distribution system differ from that of 50 years ago?**
- **What are the new trends in meat distribution?**

Sources of Supply

The meatcutter must have a good understanding of the meat industry and all phases of meat distribution. Most meat is supplied to the retailer through breakers, jobbers, purveyors, and so forth. Many of these sources purchase beef carcasses from the slaughterer. In many instances the functions of these meat sources overlap. Some breakers also operate as jobbers and purveyors along with breaking and packing. Jobbers may also be purveyors, and sometimes purveyors do jobbing work, and so forth.

Slaughterer

The slaughterer processes live cattle into carcass beef. In the distribution chain the slaughterer supplies meat to the breaker. However, in today's complex system of distribution, the slaughterer, in some cases, supplies meat to all other sources of distribution.

Breaker

The breaker receives beef from the slaughterer in carcass form and breaks it into primal cuts. Most of his customers are jobbers. In some cases, the retailer may purchase meat cuts from the breaker when he is "piecing in," which is a term used when cuts are purchased to balance the stock on hand.

Boner

The boner purchases beef, veal, or pork cuts for boning. Most boners usually buy beef from the slaughterer and/or cuts from the breaker. The carcasses are boned, fabricated, packed, boxed, and sometimes frozen for sale to processors. Some boners sell the more tender cuts such as the tenderloin and rib eye for use as low-grade steaks. Most pork boning is limited to loins and legs for use in Canadian bacon and hams, either fresh, cured, or smoked. Other boners work directly with processors who depend on that boner for all of their meat needs.

Branch House

A branch house is usually operated by a slaughterer at a more convenient location close to or in the city or town it serves. The branch house may offer products other than those supplied by the packer: fish, poultry, shellfish, smoked meats, sausage items, and so forth. Some jobbers operate branch houses, which in turn operate as purveyors.

Processor

If the distribution chain was as direct today as it was a number of years ago, the processor would purchase meat from the boner. However, today the processor purchases meat from any or all outlets, including foreign suppliers. Processors include sausage kitchens, salami factories, smokehouses, canners, convenience food manufacturers, and curing and pumping operators.

Hotel Supply House

Hotel supply houses supply meat to hotels, restaurants, coffee shops, resort and recreation areas, air lines, ships, railroads, clubs, and institutions. Meat from hotel supply houses is usually sold in the "ready-to-cook" state. In some cases they supply precooked items. Many hotel supply houses purchase their meats as prefabricated meat cuts rather than breaking and boning their own cuts, although some still do their own fabricating.

The prefab cuts are usually ready to be cut into portion-cut items or ready-to-cook items.

The hotel supply house, like the branch house, may offer items other than meat. Some are able to supply milk, cheese, beverages, and canned goods, as well as fish, poultry, and processed items. The meat items include roasts, portion-cut steaks, hamburger patties, kabobs or skewered meats, breaded meats, and many types of cooked products.

Hotel supply houses strive for volume business because competition is extremely keen. Prices are usually calculated by using one of two methods: cents-per-pound mark-up on the cost, or percentage mark-up on the cost.

Jobbing House

Almost all of today's wholesale operators may be called jobbers. A jobber used to be one who bought goods in bulk and sold to the retailer; bulk in the meat industry is carcass beef. Today the jobber fabricates the carcasses, or bulk, into smaller cuts for sale to retailers, or in many cases to restaurants and hotels. In some cases the jobber fabricates meat cuts to the customer's specifications. The jobber is usually referred to as the "middle man."

Study Assignment

1. Albert Levie, *Meat Handbook* (Third edition). Westport, Conn.: Avi Publishing Co., 1970. Read chapter 6.
2. *Meatcutting Workbook,* Part 1. Sacramento: California State Department of Education, 1982. Read pp. 87–89.

UNIT B – JOBBING

TOPIC 1 – DISTRIBUTION CHAIN

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The slaughterer processes live cattle into __1__ beef and supplies meat to the __2__. 1. _____ 2. _____

2. The breaker purchases carcass beef from the __3__ and breaks the carcasses into __4__ cuts. 3. _____ 4. _____

3. Boners usually buy __5__ -type carcasses and pork cuts for sale to __6__. 5. _____ 6. _____

4. Almost all pork boning is limited to __7__ and __8__ for processing into smoked items. 7. _____ 8. _____

5. A __9__ buys meat for use in sausage making, canning, and smoking. 9. _____

6. Processors use __10__ beef and pork because it is convenient to handle. 10. _____

7. Hotel supply houses usually sell meat in the __11__ to __12__ state and offer such products as __13__ cut steaks and chops. 11. _____ 12. _____ 13. _____

8. Hotel supply houses usually purchase __14__ meat cuts. 14. _____

9. A jobber is one who buys goods in __15__ and sells to retailers after fabricating carcasses into __16__ cuts. 15. _____ 16. _____

10. A jobber is sometimes referred to as the __17__ __18__. 17. _____ 18. _____

UNIT B – JOBBING

TOPIC 2 – INSTITUTIONAL MEAT PURCHASE SPECIFICATIONS

This topic, "Institutional Meat Purchase Specifications," is planned to provide answers to the following questions:

- What are the purchase specifications for beef, lamb, veal, and pork, and how do the specifications differ?
- What are the technical terms used in the purchase requirements?
- What is meant by "standardized meat cutting?"
- What are some of the detail requirements for the different kinds of meat?

The U.S. Department of Agriculture has prepared a series of Institutional Meat Purchase Specifications (IMPS) for use in meat procurement programs in which the meats supplied are examined, accepted, and certified by federal meatcutters. The specifications standardize the names of wholesale meat cuts and provide detailed requirements for the different meat products.

Specification Terminology

Each cut of meat listed in the specifications is called a product. The number assigned to each product is called the item number. For example, in IMPS 100 a 131- to 157-pound bone-in forequarter is listed as item No. 102. This particular item falls within the smallest weight range, namely, Range A.

The weights of carcasses and wholesale cuts fabricated from the hindquarters are listed with the same headings as the forequarters but with different item numbers. In some cases the product will have a letter identification as well as an item number. For example, the hindquarter is item No. 155, and the boneless hindquarter is item No. 155A.

In order to meet the meat purchase specifications standards, the purchaser must specify either the quality or a combination of the quality grade and the yield grade. The purchaser must also specify the weight range and the state of refrigeration, which may be fresh, chilled, or frozen. In some instances the purchaser must also specify any fat limitations or maximum average thickness.

The detailed requirements set forth in the specifications ensure that the product is derived from sound carcasses and well-trimmed primal cuts. The product must be handled in accordance with good commercial practices, with attention given to color, saw residue, scores, cuts, and foreign odors.

Standardized Meat Cuts

Standardized meat cutting simply means that certain specifications must be followed to produce a particular cut or product. It also means that cuts or products are identified only by the names listed in the meat purchase specifications. Therefore, when a steak is listed in the specifications as a strip loin steak, it cannot be called or referred to by any other name, unless that name is listed in the specifications and has an item number. A good example is the breakfast steak, which does not have an item number assigned to it at this time. If this steak is produced from the eye of the round, it must be called by the product name and item number–Outside Round Steaks, item No. 1,169.

The specifications for standardized meat cuts are being used more and more in wholesale and jobber operations. They are also becoming more popular as the meat industry makes numerous technological changes, particularly in central cutting plants at the retail level, where they strive for standardization of meat cuts in their prefab or block-ready cuts.

Standardized meatcutting tends to make broader use of the branch house type of operation. It is possible that meat may be delivered to the branch house packed in plastic wrap and boxed with an identification number imprinted on the box. Many jobber operations use this type of purchasing for institutional and restaurant accounts but still do their own fabricating of certain types of cuts.

The price of wholesale cuts may vary with the weight range of the carcass. The heavier carcasses may bring a lower price, and the smaller carcasses may bring a higher price. At the wholesale level, this price differential is attributed to portion cutting, that is, some restaurants and retailers like to use small strip steaks cut thick rather than large strip steaks cut thin. However, a large boneless top

sirloin may be more desirable for cutting two- or three-way sirloin steaks. Carcasses that weigh from 500 to 900 pounds are generally more in demand.

Beef Specifications–Series 100

The specifications list five weight ranges for use in ordering primal, fabricated, and boneless beef cuts. Also, they give external fat limitations for each quality grade of beef.

The apprentice meatcutter will find that it is not easy to memorize all of the product names, item numbers, weight ranges, or other specification details in one sitting. But as the apprentice progresses through the unit, suggestions are made to help him accomplish this task. At the outset, the apprentice should identify the most popular cuts of meat by their product names and relate them to the item numbers given for each of the products.

In the specifications for fresh beef, item numbers for the forequarter range from 102 through 137, while item numbers for the hindquarter are listed from 155 through 193. Item numbers 102, 116, 155, 166, and 189 have letters in addition to numbers to more closely identify the product. The specifications also have item numbers 130 through 154 reserved for any new products that may be developed in the future.

Lamb and Mutton Specifications–Series 200

Specifications covering lamb, yearling mutton, and mutton also use item numbers, product names, and weight ranges, however, the weight range of lamb and mutton is listed by number rather than by letter.

The item numbers for lamb and mutton run from 200 through 238. For example, item No. 207 is used to identify shoulders (double) in weight range No. 1. The weight of the shoulders ranges from 8 to 10 pounds for lamb and from 14 to 19 pounds for mutton.

Most of the weights given for the various products are for double cuts or pairs. This means that the weight given for item No. 207 is for a double shoulder of lamb rather than a single shoulder. When single shoulders are specified, one half of the weight is considered the range of that item.

The detailed requirements for lamb indicate that the product must be derived from sound, well-dressed, unsplit lamb or mutton carcasses. The cuts must be well-trimmed market cuts unless otherwise specified The wholesale and fabricated cuts must be free from objectionable odors, blood clots, scores, and so forth.

Veal and Calf Specifications–Series 300

The veal and calf products listed in the specifications are numbered from 300 through 343. Some of the products are listed as double cuts, and some are listed as single cuts. For example, item No. 332 lists the product as a loin, trimmed (double), and item No. 333 lists the product as a full loin, trimmed (single).

The index of products in the IMPS gives three weight ranges for both types of meat. Also, both veal and calf are available in six different grades, ranging from U.S. prime to U.S. cull.

The detailed requirements for veal and calf are basically the same as those for lamb and mutton, but they specifically state without hide and caul fat and provide for split or unsplit carcasses.

Pork Specifications–Series 400

Specifications for pork carcasses and wholesale cuts differ somewhat from the specifications previously discussed in this topic. The item numbers in pork specifications range from 400 through 421, and the products are listed as cuts. The weight ranges are given in pounds rather than by numbers or letters. Also, the specifications do not include cured, cured and smoked, smoked, or fully cooked products, which are discussed in another topic.

The pork specifications also differ from previous specifications in the selection of wholesale and fabricated cuts. Most pork is shipped to California in the form of primal cuts; therefore, the selection procedures are most important. Pork is listed in two selection categories. selection No. 1 and selection No. 2. Pork cuts are evaluated mainly on the degree of muscling and quality of intramuscular and internal fat. The cut with the most meat and least fat is the most desirable. In this case, selection No. 1 contains a higher ratio of meat to fat and is considered to be the best selection.

Study Assignment

1. *Institutional Meat Purchase Specifications.* Washington, D.C.. U.S. Department of Agriculture Consumer and Marketing Service, Livestock Division, 1970. Read following specifications as assigned by instructor:
   a. *General requirements*
   b. *Fresh Beef–Series 100*
   c. *Fresh Lamb and Mutton–Series 200*
   d. *Fresh Veal and Calf–Series 300*
   e. *Fresh Pork –Series 400*
2. *Meat Buyer's Guide to Standardized Meat Cuts.* Prepared by the National Association of Meat Purveyors. Read pages assigned by instructor.

UNIT B – JOBBING

TOPIC 2 – INSTITUTIONAL MEAT PURCHASE SPECIFICATIONS

Study Guide

Determine the correct word for each blank in a sentence, and write the word in the corresponding blank at the right.

1. Meat cuts listed in the Institutional Meat Purchase Specifications are called the __1__. 1. _____

2. Each cut of meat listed in the IMPS is identified by an __2__ __3__. 2. _____ 3. _____

3. Beef hindquarter cuts are numbered from __4__ through __5__. 4. _____ 5. _____

4. Weight ranges for beef are listed by __6__, while weight ranges for lamb, mutton, veal, and calf are listed by __7__. 6. _____ 7. _____

5. Item numbers 130 through 154 are reserved for __8__ __9__ that may be developed in the future. 8. _____ 9. _____

6. A majority of the weights given for lamb and mutton products are for __10__ cuts or __11__. 10. _____ 11. _____

7. Pork products are numbered from __12__ through __13__. 12. _____ 13. _____

8. Veal and calf carcasses are numbered from __14__ through __15__. 14. _____ 15. _____

9. The specifications for pork list the wholesale and fabricated cuts by __16__ __17__. 16. _____ 17. _____

10. Lamb and mutton items are numbered from __18__ through __19__. 18. _____ 19. _____

UNIT B – JOBBING

TOPIC 3 – PORTION CUT MEAT PRODUCTS

This topic, "Portion Cut Meat Products," is planned to provide answers to the following questions:

- What are portion control meats?
- How are the basic or primal cuts related to portion cuts?
- What method of study is suggested for learning the IMPS?

The portion control meat cuts referred to in this topic are taken from the carcass, primal cuts, and subprimal cuts that were previously described and called wholesale cuts. Portion control cuts are numbered in thousands and are sometimes called retail cuts, which are offered directly to the customer in the food market.

Portion Control Beef Cuts

Once the apprentice meatcutter has learned the names and numbers of the basic or primal beef cuts, he should be able to identify any portion control cut with its basic cut. The basic or primal cuts called out in the IMPS are the beef round, beef loin, beef rib, and beef chuck (short cut). These cuts are numbered in the hundreds. When portion control cuts are fabricated from basic or primal cuts, they are assigned item numbers in the thousands. For example, item No. 168 is an inside round, and item No. 1,168 is a portion cut taken from an inside round. Also, some item numbers include a letter, such as A, B, or C, to indicate boneless cuts, or the letter R, which indicates that the product is a roast.

The apprentice meatcutter should be able to identify item No. 1,167R in a systematic manner using the ground rules outlined in the IMPS. First, the four digits in the item number indicate that the product is a portion control cut. Second, the last three digits of the number, 167, tell the meatcutter that the product is derived from beef. Third, the last two digits of the number, 67, indicate that the basic cut is a beef knuckle. And finally, the letter R at the end of the item number reveals that it is a roast; therefore, the item is identified as a beef knuckle roast.

The index of beef steak portion sizes is given in ounces, while beef roast portion sizes are listed in pounds. The smallest steak portion is 3 ounces, and the largest portion is 32 ounces. The smallest roast is item No. 1,186R, which is a boneless and trimmed bottom sirloin butt in the suggested weight range of under 4 pounds to 6 pounds and up. The largest roast listed is item No. 1,107R, which is a rib, bone-in, short cut in the weight range of under 20 pounds to 30 pounds and up.

Portion Control Lamb, Yearling, and Mutton Cuts

Because there are fewer cuts of lamb than cuts of beef, all lamb cuts, including roasts, are covered in one index. Lamb roasts, as with beef, are identified by including the letter R in the item number. The letters A, B, C, and so forth indicate a boneless cut, except for item No. 1,204A, which is a Frenched lamb chop. One other exception is item No. 1,234AR, which is a tied, boneless leg of lamb. A bone-in leg of lamb is considered as a basic cut and not a portion cut; therefore, it is not listed in the index of portion cuts.

Lamb, yearling mutton, and mutton chops range in weight from 3 to 10 ounces, and roasts are suggested at from under 4 pounds to 11 pounds and up. The apprentice should have no difficulty learning the item numbers because there are only eight items listed in the lamb index.

Portion Control Veal and Calf Cuts

Veal and calf do not have a separate index for roasts. Except for the letter R, which indicates a roast, only item No. 1,136A, which refers to a special veal cutlet, carries a letter. All other items have four digits. The smallest suggested portion size for veal and calf chops and steaks is 3 ounces, and the largest is 16 ounces. For roasts, the weight range is from under 6 pounds to 22 pounds and up, with veal stew shown in the amount specified. The veal and calf index lists only 13 items, four of which are roasts and one of which is veal stew.

Portion Control Pork Cuts

The pork index includes both chops and roasts. Items listed in the index are cuts from the ham, loin, or Boston butt. The suggested weight range

for pork chops is from 3 to 10 ounces and from 4 to 6 pounds for roasts.

Although the indexes for beef, lamb, veal, and pork show specific weight ranges, the purchaser is not bound by the portion sizes. He may specify any other reasonable size. The pork index lists a total of 15 items, including pork filets, which may be produced from the ham, picnic, or loin, and pork for chop suey.

Study Assignment

1. *Institutional Meat Purchase Specifications for Portion-Cut Meat Products—Series 1,000.* Washington, D.C.. U.S. Department of Agriculture Consumer and Marketing Service, Livestock Division, 1970. Review entire specification.
2. *Meat Buyer's Guide to Standardized Meat Cuts.* Prepared by the National Association of Meat Purveyors. Read pages assigned by instructor.

UNIT B – JOBBING

TOPIC 3 – PORTION CUT MEAT PRODUCTS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write the word in the corresponding blank at the right.

1. The carcass, primal cuts, and subprimal cuts are used to produce __1__ __2__ cuts. 1. _____ 2. _____

2. Portion cuts that are sold directly to the housewife are sometimes called __3__ cuts. 3. _____

3. The beef carcass and basic cuts are numbered in the __4__ series. 4. _____

4. Portion control beef items are numbered in the __5__ series. 5. _____

5. When the letter R is included in an item number, it means that the item is a __6__. 6. _____

6. A portion control cut is indicated by a __7__ __8__ number. 7. _____ 8. _____

7. The last three digits in item No. 1,167 indicate that the meat is produced from a __9__ carcass. 9. _____

8. The largest portion size for beef steaks is __10__ ounces. 10. _____

9. The index for __11__ is the only one that divides steaks or chops and roasts into two indexes. 11. _____

10. The suggested sizes for portion lamb items range from __12__ to __13__ ounces. 12. _____ 13. _____

11. Lamb portion cuts are numbered in the __14__ series. 14. _____

12. Veal portion control items are numbered in the __15__ series. 15. _____

13. The suggested size for pork chops is the same as that suggested for __16__ chops. 16. _____

14. A weight range of 3 to 16 ounces is suggested for __17__ chops. 17. _____

15. Pork portion control cuts are numbered in the __18__ series. 18. _____

UNIT B – JOBBING

TOPIC 4 – ORDER PROCESSING

This topic, "Order Processing," is planned to provide answers to the following questions:

- **What factors must be considered when meat products are received from the supplier?**
- **What factors must be considered when meat products are processed for delivery to the customer?**
- **What factors must be considered when a product is packaged and labeled for shipping or delivery?**

A manifest is a list or invoice of the cargo or product that is given to the person receiving the goods. The product is checked against the manifest when it is taken from the cargo vehicle. The receiving station must be operated efficiently and honestly or much of the profit could be lost before the meat has been delivered. Unfortunately, the purchaser may suffer a financial loss because of collusion involving the receiver, driver, and other persons. Purchase requisitions, purchase specifications, and delivery manifests should be available to the person receiving the product.

Weighing Meat Products

Meat items are checked against the manifest for correct weight as they are taken from the cargo vehicle. The person dispatching the cargo and the receiver usually agree on the items to be delivered first. All of one item should be dispatched and checked before a different item is unloaded. For example, a purchaser taking delivery of carcass beef may wish to have the forequarters unloaded first and the hindquarters unloaded last, so that the fores may be moved into the cooler for storage and the hindquarters may be kept out for stripping and separating. Any weight error found should be reported to the proper authority.

Grading Meat Products

The grade of the product is usually indicated on the purchase specification order. The receiver should check the quality grade and any other specification shown on the sheet.

Procedures for applying plant identification (inspection) stamps vary in wholesale operations. A breaker may receive carcass beef and have the primal cuts stamped as they are received. The breaker usually sells beef in primal cuts, which reduces the chances for error and saves time in filling orders. However, a hotel supply house may sell the product as steaks, in which case the product is stamped when it is packed or boxed for shipment or for local delivery.

USDA Acceptance Stamps

When a purchaser requests delivery, the supplier may ask the USDA grader to examine the product. In this case, the grader is responsible for accepting the product and certifying that it is in compliance with the specifications. The federal grader stamps each item or sealed carton with a shielded stamp, indicating that it is USDA accepted as specified. Purchase specifications may include one or more of the following markings:

1. Quality grade
2. Class mark
3. Inspection mark
4. Yield grade mark
5. Acceptance stamp
6. Chilled or frozen marks

The USDA Acceptance Service has prepared the following list of procedures for receiving and storing meat products:

1. Make sure that a meat grading certificate, if required, is with the shipment and that all items are listed on the certificate.
2. Check meat items or containers for proper USDA acceptance stamps and grade markings.
3. Check all weights for accuracy.
4. Do not accept delivery if any discrepancies are noted. Report the findings to the purchasing agent or other proper authority.
5. Place chilled products in the cooler and frozen products in the freezer as soon as possible.
6. Remove wrappings from the chilled, fresh product. Hang large items such as carcasses, rounds, ribs, and the like on meat hooks and place smaller items on shelves.

7. Remove wrappings from smoked meat cuts and hang them on hooks or place them on shelves to permit proper circulation of air around the product.
8. Remove sausage products from master containers and hang them on shelves or hang as applicable.
9. Loosen covers from containers of chilled or diced meat.
10. Store new products to the rear of previously received items to assure that older stock will be used first.
11. Remove or obliterate all USDA markings before discarding empty containers.

Portion Control

The use of Institutional Meat Purchase Specifications is not mandatory at this time, but they are used as a guide for supplying and purchasing meat. A supplier or purchaser may also use other specifications that provide requirements for special trimming, quantities, weights, or tolerances greater or less than those given in the IMPS.

Study Assignment

1. Albert Levie, *Meat Handbook*. Read Chapters 3, 7, and 10.
2. *Meatcutting Workbook*, Part 1. Sacramento: California State Department of Education, 1981. Read pp. 117–127.

UNIT B – JOBBING

TOPIC 4 – ORDER PROCESSING

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. When cargo is discharged, the receiver should check the items against a list or invoice called a __1__. 1._____

2. Purchase __2__ and __3__ must be available to the person receiving the product. 2._____ 3._____

3. The person __4__ the cargo and the __5__ agree on the order in which the items are to be unloaded from the cargo vehicle. 4._____ 5._____

4. The grade of the product is usually found on the __6__ __7__. 6._____ 7._____

5. A breaker who sells beef as primal cuts may have the beef stamped immediately on __8__. 8._____

6. The supplier may ask a USDA __9__ to examine the product. 9._____

7. The grader is responsible for __10__ the product and __11__ that is in compliance with the specifications. 10._____ 11._____

8. The acceptance stamp on a sealed carton displays the words: __12__ as __13__. 12._____ 13._____

9. A receiver should check __14__ for accuracy and report any discrepancies to the proper authority. 14._____

10. Chilled products should be put into the __15__ as soon as possible after they are received. 15._____

UNIT C Sausage, Cured Meats, and Convenience Foods

TOPIC 1 – TYPES OF SAUSAGE AND CONTENTS

This topic, "Types of Sausage and Contents," is planned to provide answers to the following questions:

- How was sausage developed?
- What are the generally accepted sausage classifications?
- What are the basic ingredients of sausage?
- What kinds of casings are used in making sausage?
- What kinds of equipment are used to manufacture sausage?

Sausage, which is one of the oldest forms of processed foods, was made long before history was recorded. The modern day sausage was not invented but was developed over many years of blending, drying, salting, and smoking. It evolved from ancient times when it was most important to find ways of preserving food for storage over the long winter months.

Different parts of the world are known for certain types of sausage. Climatic conditions and the availability of ingredients and spices account for some of these differences. Many of the names given to sausage are for the location of development. Genoa, for Genoa salami, Frankfurt, for the frankfurter, Bologna, for bologna sausage; and so forth.

Sausage Ingredients

The ingredients of today's sausage are mainly beef, pork, salt, and seasonings. The casings are made from beef, hog, and sheep intestines, or from artificial materials or cloth bags. The major ingredients, beef and pork, may be: (1) in any combination and include nonfat or dry milk; (2) predominately beef and include nonfat or dry milk; (3) predominately pork and include nonfat or dry milk; or (4) all beef. The combination of meat and spices usually varies with the type of sausage.

Sausage Classifications

Sausage is difficult to classify because of the many different combinations of meat and spices used in these products. Classifications are usually made according to particular characteristics and method of processing. Most sausage items fall into one of the following classifications:

1. Fresh sausage
2. Uncooked smoked sausage
3. Cooked smoked sausage
4. Luncheon meats and jellied products
5. Fermented or dry sausage

These classifications are not distinct but are generally accepted. Close examination of the supermarket Deli case will give an indication of the many different types and variations in the classes of sausages. However, for purposes of simplicity, the various classes may be grouped under two general classifications: Domestic and Fancy.

Sausage Specifications

The *Institutional Meat Purchase Specifications for Sausage–Series 800*–covers requirements for 17 different kinds of sausage products, which are listed by item number in Table C-1.

The products must contain only those kinds of meats specified in the specifications. Curing, cooking, smoking (except for loaf items, smoke flavoring or artificial smoke is permissible in lieu of smoking) and flavoring of the product must be normal to the particular kind of product produced. The amounts and kinds of all ingredients must be within the tolerances permitted by the applicable meat specification regulations.

Sausage Manufacturing

The basic steps for manufacturing most sausages are chopping, mixing, stuffing, linking, and hanging.

TABLE C-1

Index for Sausage Products—800

Item No.	Product
800	Frankfurters
801	Bologna
802	Pork sausage
803	Liver sausage
804	Cooked salami
805	Minced luncheon meat
806	Lebanon bologna
807	Thuringer
808	Dry salami
809	Cervelat
810	Breakfast sausage
811	Smoked sausage
812	New England brand sausage
813	Polish sausage
814	Meat loaves
815	Meat food products
820	Head cheese

Since sausage making is a specialized trade, it would be impossible to cover the subject fully in a few pages. Therefore, only a general discussion of the basic products is given by the classifications presented at the beginning of this topic.

Fresh Sausage

Fresh sausage is made mainly from pork that has not been cured. The variation in the ratio of fat to lean is responsible to some degree for the difference in overall palatability of the finished product. Some sausage makers say that if the ratio of fat to lean cannot be balanced, it is better to have more fat than lean; that is, an extremely fat sausage is more palatable than an extremely lean sausage.

Fresh sausage is usually identified by its color. In some instances a lean, bright-colored sausage is desirable, while in other instances a fat, white-colored product may be in demand. Also, the manufacturer may strive for a sausage that holds the color longer. Some bright, lean looking sausages will fade within hours of completion, and some fatter looking sausages will hold color for long periods of time.

Fresh sausage includes pork sausage, country- or Italian-style sausage, German-style sausage, Swiss-style sausage, beef sausage, and breakfast sausage. These sausages are manufactured to cater to the tastes of certain ethnic groups.

Smoked Sausage

Most meat is usually cured before it is smoked. For example, ham is smoked after it has been cured by pickling or dry curing. However, the method of pickle curing meat before making sausage is now considered obsolete. Today, dry-cure agents such as salt, sugar, nitrates, and nitrites are usually added directly to the meat mixture during the chopping process. Ice or water is added during the mixing process to keep down the temperature of the mixture; the water also helps to dissolve and blend the curing agents with the meat. The curing agents, or fast cures as they are often called, enable the sausage to be cured as it is being made rather than by the slow process of hanging for long periods of time before smoking.

The classifications of smoked sausage include a wide range of products such as frankfurters, bologna, Berliner, bratwurst, and Polish-style sausages. Here again, differences are in ingredients and coarseness of the grind. Bologna and frankfurters are produced from a very finely comminuted meat. Pork sausage is moderately coarse, and Polish and Berliner sausages are coarsely comminuted.

Cooked Smoked Sausage

Although most smoked sausage is cooked, a few such as Polish- and country-style sausage are generally cooked before eating. Sausages are cooked and smoked at the same time. However, a relatively new process called liquid smoke is being used more often today. The product is put into a room similar to a smoke room, where it is covered with liquid smoke from a fine atomizer-type sprayer. After it has been under the spray for a specified length of time, the product is taken to another room, which is in effect a steam cooker. The main advantage of this type of process is that it reduces the possibility of air pollution that may contaminate the product.

When liquid smoke is applied to the external surface of the sausage by the spray process, it need not be indicated on the label. If liquid smoke is added to the sausage before it is put into the casing, the label must indicate that the product contains liquid smoke. The present regulations state that any product containing liquid smoke cannot be labeled as smoked, unless the product is smoked in addition to containing liquid smoke.

Dry Sausage

Dry sausage, even though it spoils under certain conditions, may be considered as a preserved product because of its keeping qualities. This product has a stable shelf life and requires no refrigeration. It is probably what the ancient sausage makers were trying to develop for storage over the long winter months.

Dry sausage, like other classes of sausage, reflects the great influence of the people who came to this country from the different regions of Europe. Italian-style sausage, for example, reflects the differences between the northern and southern parts of Italy: Genoa and Toscano salami.

Dry sausage processing. This type of sausage is eaten without cooking and must be processed with extra care because of the parasite called trichinella spiralis. The freezing process is used most often to rid pork meat of this parasite. The meat must be carefully trimmed to eliminate all bones, heavy connective tissue, soft fat, and sinew because the cutters are not designed to separate the undesirable pieces from the mixture.

Coarsely ground beef and flaked frozen pork are put into a chopper, where spices, curing agents, and other ingredients are blended together. In some larger operations, the seasonings and curing agents are added directly to the meat in the mixer rather than in the chopper. The ingredients may vary with the type of sausage. The ratio of fat to lean is extremely important in obtaining a uniform quality product. The texture or amount of chopping may also vary with different manufacturers. It is also important that the sausage mixture be kept cool at all times before the curing process.

Curing, fermentation, and drying. The mixture of meat, including curing agents and seasonings, is taken from the chopper and put into a mixer, where it is further blended for an even distribution of fat to lean. From the mixer, the sausage mixture is transferred to the stuffer. Here the sausage takes on a "green" appearance and is ready for the drying step, which is the most crucial process in terms of producing a quality product. The time and temperature of drying may vary with the manufacturer, but generally a temperature of 45° to 55° F. and a relative humidity of 70 to 72 percent is maintained. Air circulation is also a factor in the drying process.

Types of dry sausage. Dry sausage may also include sausages that are not dry but are semidry. The semidry sausage is known by names such as Thuringer, cervelat, summer sausage, or farmer-style sausage. Some semidry sausages such as Gotebory cervelat and Italian mortadella are also smoked.

Sausage Casings

Two types of containers or casings are used for sausage—natural casings made of internal organs from sheep, hogs, cattle, and goats, and cellulose casings made from cotton linters, which are solubilized and regenerated into casings of any diameter. Sausage experts think that natural casings are superior to synthetic casings because of their form-fitting and flavor-sealing ability.

Natural Casings

The first sausage casings were made of intestines taken from the same animal that produced the meat for the sausage. Natural casings come from the intestines, stomachs, and bungs. Other parts of the carcass, such as the skin, backfat, and internal fat, are also used to encase sausage. But in most cases, skin and fat are put into some kind of mold as a liner and then the sausage mixture is added to the mold. When the sausage is taken out of the mold, it is encased in the skin or fat.

Sheep and hogs produce most of the natural casings, the most valuable casings come from the sheep. Compared to sheep and hogs, beef produce very little material that is usable for casing. Some of the viscera, bladders, and weasand, which is the lining of the esophagus, are used by sausage makers. Also, natural casings from beef middles and hog bungs are sewn together to provide a casing of greater diameter or length.

Artificial Casings

Cellulose casings are used to enclose small items such as frankfurters and large items such as bologna. Small diameter casings are usually in the form of shirred tubes that are slipped over the stuffing tubes. The length of the casing varies up to 100 feet, depending upon the equipment. Large diameter cellulose casings are usually packed flat and bound in bundles. This type of casing is soaked prior to use and is slipped over the stuffing tubes individually to produce bologna over 3 feet long, which is usually sliced mechanically after easy removal of the artificial casing.

Chemically treated cloth bags made of cotton thread are also used to encase sausage products. This type of casing is porous and allows the fat to escape and flow over the surface of the sausage to form a covering that seals the product. Another casing is made of cotton fibers treated with a cellulose substance that allows the casings to be printed or color pigmented, thereby giving the product a more desirable appearance. Other fibrous casings are produced from regenerated cellulose embedded with cellulose or other fibrous mesh reinforcement. This casing is very strong and is used for the dry and semidry sausage because it adheres so well to the product and is easy to remove. Cellulose casings are usually clear and

transparent, while fibrous casings may show some color due to the fibers in the material.

Sausage Making Equipment

Certain equipment is essential in large-scale sausage production, including such items as the flaker, grinder, chopper, mixer, emulsifier, stuffer, and so forth.

The *flaker* is used to cut frozen meat into thin flakes (Fig. C-1). Flaked pork is mixed with ground beef to make salami and other sausages.

A *grinder* is used to cut meat into small pieces, which are usually mixed with other meat to make sausage (Fig. C-2). Different size plates are used to cut meat to the desired coarseness. The hole size varies from ⅛ inch and larger, depending on the formula.

Meats such as flaked pork and ground round are chopped and blended with a *chopper* or *blender* (Fig. C-3). All other ingredients, including ice, are usually added during the chopping process. In some cases, sausages are ready for stuffing after the chopping process has been completed.

An *emulsifier* is used to blend the sausage mixture to an extremely fine ground, smooth product. The emulsifyer contains one or more series of knives that rotate at a tremendous rate of speed. The sausage mixture is passed through the rotating blades and then forced through perforated plates similar to those of a grinder but with much smaller holes in the plate.

Mixers are used to further blend the sausage mixture prior to stuffing (Fig. C-4). Most mixers look something like a large round bottom tub with two sets of mixing paddles or blades that rotate in opposite directions inside the tub.

The *stuffer* is used to force the sausage mixture into the casings. It looks like a huge cylinder with an air-operated piston that forces the meat into the stuffing tubes (Fig. C-5). The flow of the mixture is controlled by a hand, foot, or leg operated lever. Foot or leg levers are used to enable the operator to have both hands free to control the product as it is stuffed. The *linker* (Fig. C-6) is usually used in conjunction with the stuffer.

Other equipment such as extruders, smokers, and cookers are also used in sausage manufacturing. Ultramodern sausage kitchens are almost fully automated with machines and computers that are responsible for producing sausage items of consistent quality.

Study Assignment

1. John R. Romans and P. Thomas Ziegler, *The Meat We Eat.* Read Chapter 15, pp. 531–57.
2. *Institutional·Meat Purchase Specifications for Sausage Products–Series 800.* U.S. Department of Agriculture. Review entire specification.

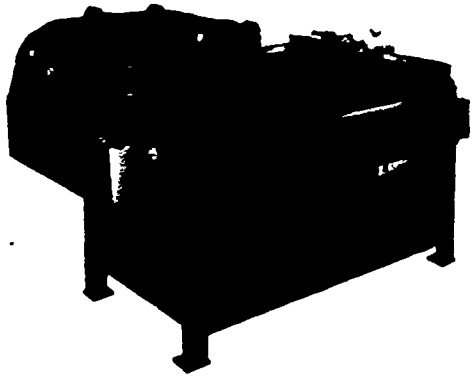


Fig. C-1. Flaker

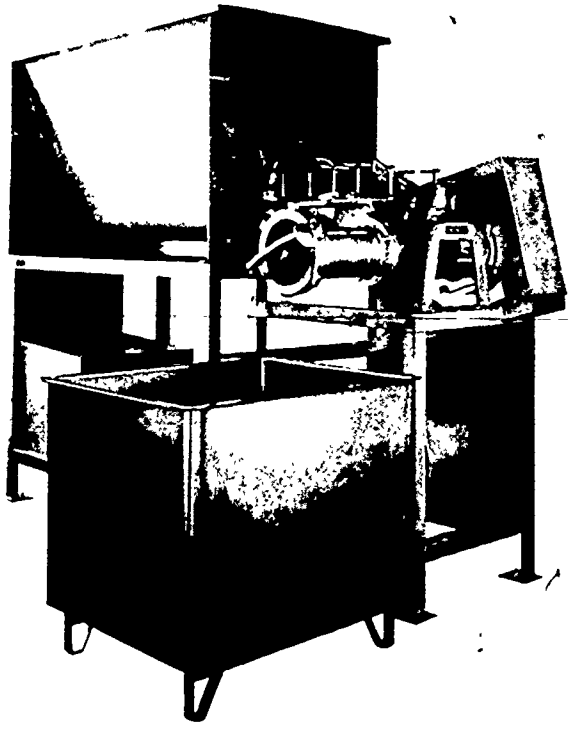


Fig. C-2. Grinder

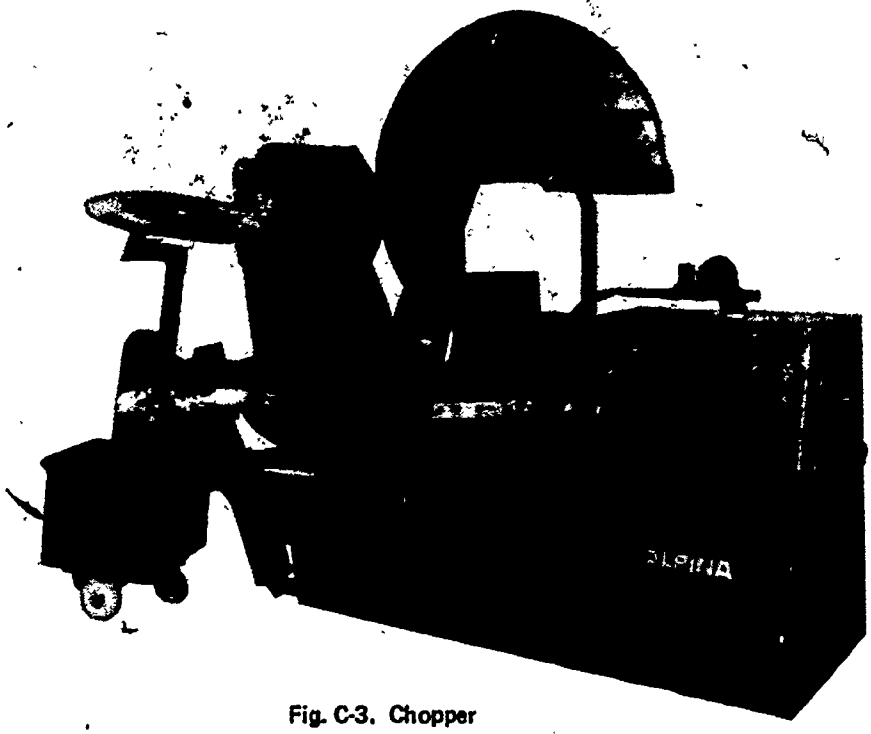


Fig. C-3. Chopper

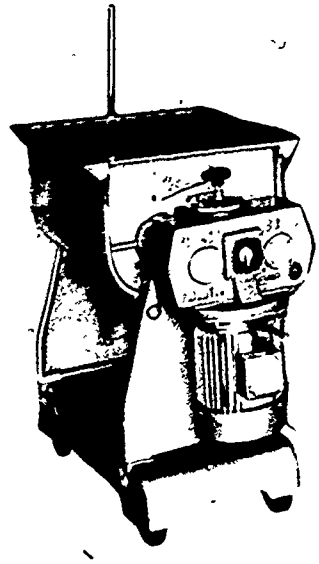


Fig. C-4. Mixer

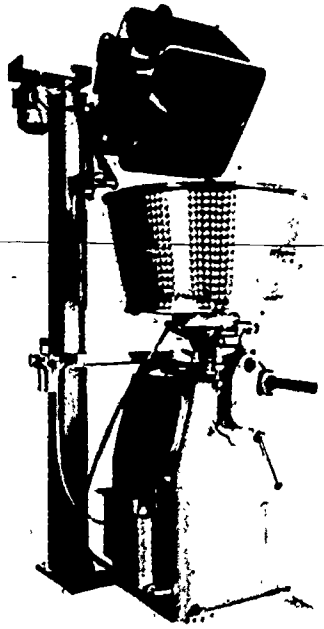


Fig. C-5. Stuffer

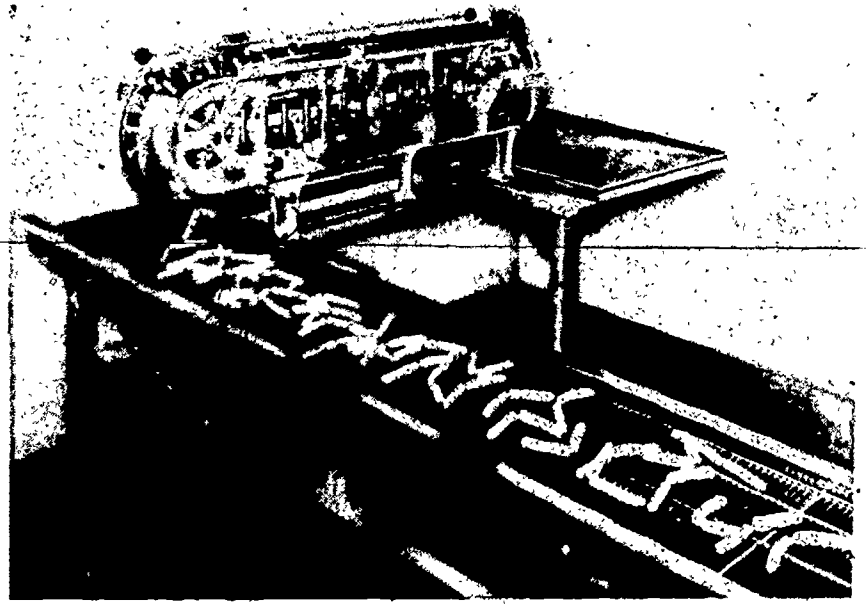


Fig. C-6. Linker

UNIT C – SAUSAGE, CURED MEATS, AND CONVENIENCE FOODS

TOPIC 1 – TYPES OF SAUSAGE AND CONTENTS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Sausage, cured meats, and convenience foods are considered to be __1__ foods. 1._____

2. The basic ingredients of sausage are __2__, __3__, __4__, and __5__. 2._____ 3._____ 4._____ 5._____

3. Processed foods are produced through changing one or more products by the application of __6__ or __7__. 6._____ 7._____

4. Sausage was not invented but was __8__ over a period of many centuries. 8._____

5. The main reasons for the different types of sausage are __9__ conditions and availability of __10__. 9._____ 10._____

6. Fat sausage is more __11__ than lean sausage. 11._____

7. A __12__ is used to cut frozen meat into thin __13__. 12._____ 13._____

8. Fresh sausage is made primarily from meat that has not been __14__. 14._____

9. The basic steps in sausage making are __15__, __16__, __17__, and __18__. 15._____ 16._____ 17._____ 18._____

10. Natural casings are obtained from the __19__, __20__, and __21__ of sheep and hogs. 19._____ 20._____ 21._____

11. One advantage of using liquid smoke is that it reduces __22__ __23__. 22._____ 23._____

12. The stuffer is used to __24__ the sausage mixture into the __25__. 24._____ 25._____

13. Artificial casings are usually made of __26__. 26._____

14. The most critical step in making dry sausage is __27__. 27._____

15. Dry curing agents such as salt, sugar, __28__, and __29__ are added directly to the sausage mixture. 28._____ 29._____

UNIT C – SAUSAGE, CURED MEATS, AND CONVENIENCE FOODS

TOPIC 2 – LUNCHEON MEATS AND CONVENIENCE FOODS

This topic, "Luncheon Meats and Convenience Foods," is planned to provide answers to the following questions:

- **What is the difference between sausage and luncheon meats?**
- **What are some of the different types of luncheon meats?**
- **What is a convenience food item?**
- **What is the latest innovation in convenience foods?**

The products discussed in this topic include minced luncheon meats, meat loaves, meat food product loaves, head cheese, and blood sausage, which are listed in the *Institutional Meat Purchase Specifications for Sausage–Series 800.* However, the only thing these products have in common with sausage is that they are usually too large to be eaten in the form in which they are produced, and they are generally sliced and served cold.

Types of Luncheon Meats

Luncheon meats can be described in many ways, but for the purposes of this discussion they are described in accordance with the USDA specifications.

Minced Luncheon Meats

Minced luncheon meat is a smoked, cooked sausage consisting of coarsely cut pork and finely comminuted beef. Some products contain pork heart meat. A number of luncheon meat items are related to this product and are called by many names–spiced luncheon meat, chopped pork, and chopped ham to name a few. Most of these items are sold in tins up to ten pounds or more. The stuffed casing are pressed into wire or solid metal molds and formed into square, rectangular, or round shapes.

Meat Loaves

Meat loaves may be baked by dry heat or cooked by moist heat. The meat components are usually beef, pork, and veal formed into a rectangular or round shape. The loaves may be smoked, unsmoked, or browned in hot oil. Some loaves are baked in pans and are shaped like a loaf of home-made bread.

Meat Food Product Loaves

Meat food product loaves are baked (dry) or cooked (moist) and usually weigh from 4 to 8 pounds. Beef, pork, and veal may be used singly or in any combination. Lamb, mutton, goat's meat, or meat by-products may not be used to prepare the loaves. Also, sausage makers are prohibited from using products such as lungs, spleen, udder, blood, skin, or ears.

Meat food products must be specified by name, such as pickled loaf, pimento loaf, olive loaf, pepper loaf, cheese loaf, macaroni and cheese loaf, and liver loaf. The shape of the loaf is usually rectangular or round.

Head Cheese

Head cheese is a cooked product consisting primarily of pork head meats with pork, cured pork, and various pork by-products, except ears, livers, and spleens. The meat is cut fine to coarse and is stuffed into a natural or artificial casing. It usually weighs 4 to 8 pounds.

Blood Sausage

Whenever blood is used as an ingredient of a food product, it must be mentioned in the name of the product. Some of the more popular blood products include Berliner blood sausage, which contains bacon cubes rather than pork fat and is cooked and smoked. Blutwurst is a German blood sausage that is made of pig's blood, pork fat, veal tongue, or other meat. If blutwurst is stuffed into a natural pork casing, it is sometimes called Thuringer blutwurst. Other blood products include blood puddings such as Biroldo Toscano, black pudding, and blood and tongue pudding.

Convenience Foods

A convenience food may be one or more of hundreds of food items found on the food shelves, in the freezer, or among displays in thousands of grocery stores, butcher shops, and the like. It is just what the name implies–convenient.

A cut-up chicken is more convenient to fry than a whole chicken, or a ready-cooked chicken is more convenient than an uncooked chicken when

dinner has to be prepared in a relatively short period of time. The degree of convenience will vary, depending on the situation and the food item.

A convenience food is usually thought of as a "heat-and-eat" preparation such as a TV dinner. Many of these dinners come complete with rolls and require no preparation, except for heating. The TV dinner was originally considered as an emergency dinner replacement for people who had little time to prepare a hot meal. However, this concept is no longer true today. People purchase TV dinners by the dozens and store them in their home freezers for everyday use. Emergency situations have given way to convenience.

The newest innovation in convenience foods is the freeze drying process. Freeze-dried fruits are used in many breakfast preparations, and freeze-dried meat cubes are used in dry, packaged soup mixes. A demand has developed for packaged freeze-dried foods for campers and hikers. These foods are lightweight and compact and require no refrigeration or special handling, except care in preventing the puncture of the package. Freeze-dried foods are easily reconstituted in water, retain their shape, and maintain good color, texture, and taste. Although freeze-dried products are considered to be expensive, the convenience of the item more than compensates for the extra cost.

Study Assignment

Institutional Meat Purchase Specifications for Sausage Products–Series 800. U.S. Department of Agriculture. Read pages assigned by instructor.

UNIT C – SAUSAGE, CURED MEATS, AND CONVENIENCE FOODS

TOPIC 2 – LUNCHEON MEATS AND CONVENIENCE FOODS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The main difference between sausage and luncheon meats is that luncheon meats are usually 1 and served 2 . — 1._____ 2._____

2. Minced luncheon meat is a smoked, cooked 3 . — 3._____

3. Meat loaves may be smoked, unsmoked, or 4 in hot oil. — 4._____

4. Meat food product loaves must be specified by 5 . — 5._____

5. Head cheese may not include 6 , 7 or 8 . — 6._____ 7._____ 8._____

6. Blutwurst is a German-style 9 10 . — 9._____ 10._____

7. Whenever 11 is used as an ingredient in a food product, it must be mentioned in the name of the product. — 11._____

8. Convenience foods are generally considered to be a 12 and 13 items. — 12._____ 13._____

9. One of the latest innovations in convenience foods is the 14 15 process. — 14._____ 15._____

10. Freeze-dried foods are reconstituted in 16 . — 16._____

UNIT C – SAUSAGE, CURED MEATS, AND CONVENIENCE FOODS

TOPIC 3 – CURED AND SMOKED MEATS

This topic, "Cured and Smoked Meats," is planned to provide answers to the following questions:

- What are some of the methods used to cure meat?
- What are some of the differences between artery pumping and stitching?
- What kinds of meat are cured and smoked?
- What are some of the reasons for smoking meat?
- What is the difference between dry-cured and dried meat?

In the past most meat cuts were cured for long-term storage without refrigeration; however, this is not necessarily true today. Modern techniques produce mildly cured products that have some keeping qualities but which usually require some refrigeration. Except for dry-cured meats, most cured meats need no parboiling or soaking before baking or other cooking. Modern methods used for curing produce a product that is less salty and more palatable.

Artery pumping is still a popular method of curing large cuts of meat such as hams and outside rounds of beef. The thinner boneless cuts, such as pork bellies, provide bacon and salt pork and are stitched by hand or with automatic stitching machines. Many of the boneless cuts of beef, such as inside or outside rounds, knuckles, and even Spencer rolls, are stitched by machine.

Salt is still the basic ingredient used for curing meats. Although most cures and pickles contain other ingredients such as sugar, nitrates, nitrites, corn syrup, or molasses, some meats are cured with salt as the only ingredient. Salt-only cures are used primarily on meats that are to be used for seasoning other foods. These meats are usually fatty cuts such as bellies from older sausage-type hogs, jowls, or clear plates. In some cases nitrates and nitrites are used together with salt.

Methods of Curing Meat

Most of the methods for curing meats fall into one of two categories: pickle curing or dry curing. Pickle curing, also known as brine curing, is a method in which the ingredients are dissolved in water and introduced into the meat by soaking or injection. Dry curing is a method in which the ingredients are introduced to the surface of the meat to withdraw most of the moisture.

Dry Curing

Dry curing is not used as much as pickle curing because dry-cured products are too expensive to produce, are very salty, and often show a loss of desirable color. The cost factor is due mostly to the time it takes to produce dry-cured meats. Thick cuts of ham usually require about two days per pound for curing, while dry-cured bacon takes about two weeks to complete the process.

Although dry-cured meats are expensive, salty, and require a lot of space, they are considered to be a high quality product. With proper cooking techniques, dry-cured hams and bacon are considered to be gourmet items by many consumers and cooks. People who buy dry-cured hams find the enjoyment of eating them well worth the cost, time, and effort of preparation.

Pickle Curing

Pickle curing is the most popular method of curing and is usually done by artery pumping or stitch pumping.

Artery pumping. Artery pumping is said to have been developed by an embalmer from New Zealand, who theorized that embalming principles could be applied to curing meat by dissolving the curing agent in water and then injecting it into the arteries. Artery pumping has many advantages, some of which are as follows:

1. The curing agents are distributed throughout all parts of the meat.
2. The cure is uniform.
3. The curing time is reduced to hours rather than days or weeks.
4. The cure is milder and takes less time than dry curing.
5. The ingredients are the same as those used in most dry cures, except that they are introduced into the meat in the liquid form.

Stitch pumping. Stitch pumping is usually applied to boneless cuts by one needle with several openings or many needles on a handle or a machine placed either in parallel or offset at different angles (Fig. C-7). The use of stitch pumping has increased greatly because it takes less time and is adaptable to mechanized equipment. Stitching machines or injection pumps are used almost exclusively by bacon producers, but other machines are being developed for use in curing bone-in meat cuts. The pickle solution is usually injected into the meat at a temperature of 65° F. and at a rate of 10 percent of the weight of the cut being cured. A 21-pound ham may be injected with a 10 percent solution or about 2 pounds of brine or pickle solution.

Thermal Curing

Experiments have been conducted with hot cures or what is also called thermal curing, which is usually done by artery pumping a 135° to 140° F. pickle solution into hams. The hams are held in the hot pickle solution for 30 to 60 minutes and then placed directly into the smokehouse. Experiments are also being conducted in thermal dry curing, which is said to produce a higher yield, greater smoke flavor, more rapid cure, and generally improved flavor.

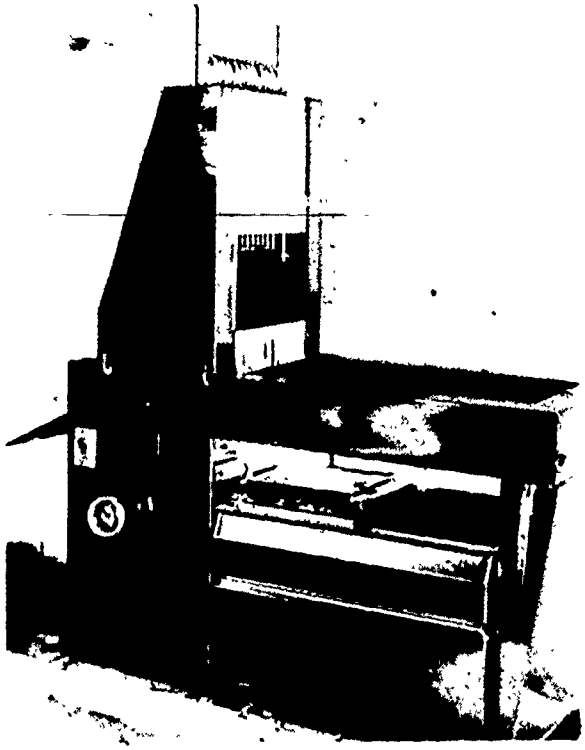


Fig. C-7. Stitching machine

Smoked Meats

The smoking process is used to develop different flavors in meat. However, as in the case of sausage items, color, preservation, and a longer shelf life are considered to be extremely important in making the product more salable. Also, some meat items are often smoked and cooked.

The methods of smoking meats are basically the same as those for smoking sausage products. The time and temperature may be different because of the thickness and size of the meat products. Many products are cooked as well as smoked, and many products are cooked while they are being smoked. In many cases cooking is the primary objective in producing certain products. Usually, smoked products are thought of as being smoked by the use of wood fuels of various types such as hickory, cherry, pine, or other hard and soft woods. In some countries corn cobs and animal dung are also used as fuel for smoking meats. Hardwoods such as hickory are usually considered to be the most desirable for producing excellent smoke flavor.

A minimum internal temperature of 140° F. should be reached in smoking hams and picnics. Federal regulations specify a minimum temperature of 137° F. for smoked meats and a temperature of 148° F. for fully cooked processed meat items. However, temperatures as high as 155° F. or more are sometimes used for frankfurters and loaf items.

Many cuts of beef and pork are cured and smoked; however, lamb cuts from the leg and shoulder have been smoked and/or cured—but with little economic value. Poultry products such as turkey and ducks have been cured and smoked with greater success than lamb. The tongues from lamb, beef, pork, and veal are cured and sometimes smoked. Every part of the hog carcass is sold as smoked or cured meat items, including the spare ribs, loins, back, and feet.

Dried Meats

Although westphalian and prosciutto hams are dry cured, smoked, and uncooked, and may be eaten without further cooking, they are considered to be cured items rather than dried meats. Smithfield hams are also dry cured and smoked but require further cooking before eating.

The difference between dry-cured and dried meats is that some dry-cured meats require cooking, while most dried meats can be eaten without further cooking. Also, dried beef contains little or

no moisture as compared to dry-cured beef. Dried beef may be produced from coarsely ground, smoked, and fully cooked meat and shaped by forms or casings and sliced for sale. Larger cuts such as beef knuckles and outside rounds of beef are used as dried beef items. Beef jerky is thinly sliced beef made from lower grade animal carcasses.

Study Assignment

1. John R. Romans and P. Thomas Ziegler, *The Meat We Eat.* Read pp. 559–92.
2. *Meatcutting Workbook*, Part 1. Sacramento. California State Department of Education, 1981. Read pp. 114-115.
3. W. E. Kramlich, A. M. Pearson, and F. W. Tauber, *Processed Meats.* Westport, Conn.: Avi Publishing Co., 1973. Read pages assigned by instructor.

UNIT C – SAUSAGE, CURED MEATS, AND CONVENIENCE FOODS

TOPIC 3 – CURED AND SMOKED MEATS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Modern methods of curing provide a product that is less __1__ and requires no __2__ or __3__. 1._____ 2._____ 3._____

2. The basic ingredient for curing meats is still __4__. 4._____

3. Salt-only cures are used on meats that are used to __5__ other foods. 5._____

4. Pickle or brine curing is a method by which the ingredients are __6__ in water and introduced into the meat by __7__ or __8__. 6._____ 7._____ 8._____

5. The disadvantages of dry-cured meats are that they are __9__ to produce, are usually very __10__, and show a loss of desirable __11__. 9._____ 10._____ 11._____

6. Dry-cured bacon takes about __12__ weeks to complete the cure process. 12._____

7. The __13__ -cure method is more popular than the __14__ -cure method. 13._____ 14._____

8. Thermal cures are also called __15__ cures. 15._____

9. The thermal-cure method consists of __16__ a 135° to 140° F. __17__ solution into hams. 16._____ 17._____

10. Stitch pumping is usually applied to __18__ cuts by one needle with several __19__ or many needles on a handle or __20__. 18._____ 19._____ 20._____

UNIT C — SAUSAGE, CURED MEATS, AND CONVENIENCE FOODS

TOPIC 4 — MICROBIOLOGY AND INSPECTION

This topic, "Microbiology and Inspection," is planned to provide answers to the following questions:

- What are enzymes, and how do they contribute to the aging process of meat?
- What is the difference between enzymes and microorganisms?
- What are bacteria, yeasts, and molds; how do they grow and multiply, and how are they controlled?
- How do microorganisms and enzymes contribute to meat spoilage?
- What are some of the defects that may occur in finished sausage products?

Meat must be used within a certain period of time or it will spoil. It may be frozen for future use, or it may be kept for a time without freezing. Although meat is perishable, it improves to a certain degree with age. Meat improves with age because of *enzymatic action,* which breaks down connective tissue and makes the meat tender and more palatable.

Enzymes

Webster defines an enzyme as any class of complex organic substances that accelerate or catalyze specific chemical transformations—as in the digestion of foods in plants and animals. The word enzyme comes from the Greek words *EN,* meaning in, and *ZYME,* meaning yeast.

Enzymes, unlike bacteria or other microorganisms, are not living things; but like microorganisms, they are affected by acids and temperature changes. To relate enzymatic action to aging, it must be understood that enzymes are present in living tissue. However, deterioration (spoilage) does not take place in normal healthy tissue. But after cattle, sheep, pigs, and so forth are slaughtered, the meat of these animals is subject to the process of deterioration. At this time, enzymes take on a new function in the form of a series of biochemical changes, many of which bring about spoilage that should not be confused with microbiological spoilage such as the bacterial action of cocci, spirilla, or bacilli.

Enzymatic Action

The connective tissue in meat is usually thought of as being made up mainly of protein, either the protein elastin, which is found in the backstrap of meat carcasses, or the protein collagen, which is abundant in the beef shank. Meat is not very tender when it contains large amounts of connective tissue. For example, the tenderloin, which contains very little connective tissue, is tender. However, the beef foreshank, which contains an abundance of connective tissue, is less tender than the tenderloin. Therefore, if connective tissue is removed from the foreshank in some way, it will be more tender. Nature's way of removing this connective tissue is called enzymatic action. Proteolytic enzymes attack and dissolve the protein in connective tissue. This enzymatic action upon the connective tissue is what takes place during the aging process.

Enzyme Preparations

Enzyme preparations have been developed and sold commercially for some time under various trade names as meat tenderizers. Probably the most widely used tenderizer preparations, either liquid or granulated, are made from papain, which is an enzyme produced from the papaya fruit. Other preparations are made from osage oranges, figs, mushrooms, and pineapples. In the natural state, many acid containing foods are used for triggering enzymatic action. Wine, wine vinegar, lemon juice, and tomato juice are a few examples.

Aging Conditions

Enzymes, like bacteria, need good conditions to reproduce. Time, temperature, and moisture are all conditions that affect bacterial or enzymatic growth. When controls are applied to these conditions, the growth of bacteria and enzymes may be accelerated or retarded.

Meats are often advertised as being aged to perfection. In order to achieve this perfection, careful control of time, temperature, and moisture (humidity) must be exercised. The condition of the meat is a factor that must be considered before initiating the aging process.

Why does high-quality meat age more quickly than low-quality meat? It could be said that high-quality meat contains less connective tissue than low-quality meat, but it would not be an accurate answer. High-quality meat contains less moisture; therefore, enzymatic action stops sooner than it does in watery, low-quality meat. This principle is used in producing dried or jerked meat. When enzymatic action stops, meat does not become more tender, but it continues to dehydrate or dry out, which is one reason why beef jerkey is rather tough to chew.

When enzymatic action in high-quality meat stops, the meat does not become more tender, but it continues to deteriorate or spoil if conditions are not controlled. In the case of dried meat, condition controls often mean the difference between the meat drying out or being contaminated by mold.

Bacterial and enzymatic action does not always produce good results. Spoilage still occurs in meat. Fat usually has a shorter shelf life than muscle. A good example is pork that is held in cold storage for a long period of time. The meat will tend to dry out, dehydrate, or freezer burn, while the fat, in many cases, becomes rancid or spoiled. When the thin layer of moisture on a carcass is removed, the fat is exposed to oxidization and usually becomes rancid, while the meat within the carcass ages to perfection. The result is well-aged beef and rancid fat, the product of lack of control of product conditions.

Microorganisms

The difference between enzymes and microorganisms is that enzymes are basically proteins that cause a chemical reaction to take place, while microorganisms are living things that take part in the reaction. Although there are other microorganisms, the three most commonly associated with meat and meat products are bacteria, yeast, and mold. These three microorganisms are everywhere; on the land, in the sea, and in the air. Not all of them are harmful. In fact, without some of them there would not be foods such as cheese, salami, wine, or yogurt. Some bacteria are helpful in the disposal of waste, particularly those used in septic tanks and in water purification systems.

Like all living things, microorganisms are made up of cells. The two main parts of a cell are the nucleus, which is the control center of the cell, and the cytoplasm, which changes food material into energy and new cell material. Both are held together by a membrane that makes up the cell wall, which in turn controls passage of material into and out of the cell.

Bacteria

Bacteria are the largest group of microorganisms. Although they number in the thousands, only a few cause diseases. Bacteria cells take five shapes, three of which are more commonly known: (1) cocci are the round-shaped cells, some of which are associated with staphylococci food poisoning; (2) bacilli are rectangular or rod-shaped cells, some of which are associated with tuberculosis; and (3) spirilla are spiral-shaped cells. Other bacteria cell shapes include vibros, which look like a comma, and fillamentos, which look somewhat like a tree branch with no leaves. Bacteria cannot be seen with the naked eye but can be seen under a microscope.

Bacteria multiply by dividing. One cell can divide into two cells by a process called binary fission. Under ideal conditions for bacteria growth, division takes place about every 20 minutes. For example, if one bacterium is left on a knife at eight o'clock in the morning, the knife will contain over one billion bacteria at five o'clock that evening. The meatcutter's job is to make sure that conditions are not ideal for the growth of bacteria.

Food, moisture, and warmth provide ideal conditions for the growth of bacteria. The most favorable temperatures for bacterial growth are between 40° and 140° F.

Most bacteria are killed at temperatures of 0° F. and below and 180° F. and above. However, these temperatures may not kill the spores, which are bacteria cells in the dormant state.

In some cases, meat products are subjected to a temperature of 180° F. only to kill the active bacteria. These products must then be stored at a prescribed temperature. If the temperature is not maintained, the dormant spores may become active and contaminate the meat product.

Yeasts

Yeasts are fungi. Mushrooms are well-known fungi that are enjoyed as a food. Yeasts are single celled like bacteria but are plants. The difference between a fungus and other plants is that the fungus contains no chlorophyll.

Just as some bacteria are useful, some yeasts are helpful. Without certain yeasts man would not have bread, alcoholic beverages, and vinegar. However, these microorganisms grow well at the low temperatures used in meat coolers, therefore, they

must be controlled at all times. Yeast does not multiply by "division," as does bacteria, but by "budding." In the budding process, small buds form on the cells and separate from the parent to form a new cell. Both bacteria and yeasts produce spores. Also, many yeasts give off a distinctive odor.

Molds

Molds are important in the production of cheeses and dry sausage such as salami. They also help in making citric acid and enzymes. Although they are helpful in producing antibiotics such as penicillin, molds may be harmful to some foods because they can produce poisons such as mycotoxins—a fact which was only recently discovered.

Inspection

Carcasses may become contaminated before, during, or after slaughter. The threat of spoilage is a continuing concern, especially to those who process meat into sausage products, because contamination may occur at any time throughout processing. The effect of contamination becomes obvious in three ways: (1) spoilage, which is visible to the eye in the form of discoloration; (2) the presence of undesirable odors; and (3) an off flavor. These three factors, which were previously described as color, flavor, and juiciness, play an important part in the palatability of a product.

Although most sausage items are cured and smoked, they are not immune to contamination. These processes are helpful in retarding or combating contamination, but they do not render the product sterile.

Discoloration

Color changes in meat may be caused by bacteria, light, temperature change, refrigeration gasses, or the effects of oxidation. Microbial discoloration is usually responsible for the product turning green. White to yellowish colors are caused by heavy concentrations of bacteria, yeasts, and molds that usually appear on the surface of the product.

Contamination of vacuum-packaged products is retarded because microorganisms need food, warmth, and moisture to grow. Also vacuum-sealed products do not allow room on the surface of the product for the microorganisms to grow. This does not mean, however, that the product cannot become contaminated from within or that it was not contaminated before it was packaged. Vacuum packaging is also helpful in retarding color fading.

Flavor

The undesirable flavors of sausage products and other processed meats may be described as sour, putrid, or rancid. Souring occurs because of fermentation and the formation of acids, principally lactic acid produced by bacteria. Certain bacteria may cause fermentation that produces carbon dioxide gas. This type of gas has no color, taste, or odor. Meatcutters usually see evidences of gassing when vacuum-sealed packages of sausage have expanded or "blown out".

Rancidity is an off flavor that develops primarily through oxidation of unsaturated fatty acids. However, enzymes also contribute to rancidity. Ozone, a gas used in refrigeration, is a strong oxidizing agent. Probably the best example of this kind of catalyst is salt, which is the base for curing processed meats.

Rancidity is the major reason for the shorter shelf life of fat. When moisture is removed from the surface and the product is exposed to the air (oxygen), the fatty acids become oxidized, and the fat becomes rancid.

Proteolytic enzymes attack protein and dissolve the connective tissue. However, some enzymes are only capable of metabolizing or breaking down amino acids. The bacterial breakdown of protein causes a foul odor that is called putrefaction.

Palatability

When all conditions are perfect, the product is considered to be extremely palatable or good to eat. When conditions are less than perfect, the product is less palatable. Color, flavor, and juiciness are factors that determine palatability of a product. When all of these factors are favorable, the product is said to be of high quality. Meat is graded on the basis of quality as well as conformation and finish. All of these factors have to be considered in making a high-quality, extremely palatable product.

Specifications

The *Institutional Meat Purchase Specifications Series 800* provide criteria for conducting internal and external examinations on finished sausage products. The criteria are presented in three tables for stick items, link items, loaf items, and pork and breakfast sausage. Each table gives a description of the defect, assigns a number to each type of defect, and classifies the defect -severe, major, or minor.

Study Assignment

1. John R. Romans and P. Thomas Ziegler, *The Meat We Eat.* Read pp. 25 76 and 564 68.

2. *Institutional Meat Purchase Specifications for Sausage Products–Series 800.* U.S. Department of Agriculture. Review entire specification.

3. W. E. Kramlich, A. M. Pearson, and F. W. Tauber, *Processed Meats.* Read pages assigned by instructor.

4. Harry Weiser, *Practical Food Microbiology and Technology*, Westport, Conn.. Avi Publishing Co., 1962. Read pages assigned by instructor.

5. *Bacteria, Yeasts, and Molds.* Bulletin No. 704: Athens, Ga., University of Georgia College of Agriculture, 1972. Read pages assigned by instructor.

UNIT C – SAUSAGE, CURED MEATS, CONVENIENCE FOODS

TOPIC 4 – MICROBIOLOGY AND INSPECTION

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Although meat is perishable, it improves to a certain degree with __1__. 1._____

2. Enzymes, unlike bacteria, are not __2__ things, but they are found in living __3__. 2._____ 3._____

3. Meat with a great deal of connective tissue is __4__ __5__. 4._____ 5._____

4. Proteolytic enzymes __6__ and __7__ protein in connective tissue. 6._____ 7._____

5. Papain is an enzyme made from the __8__ fruit. 8._____

6. Time, temperature, and moisture control are conditions affecting better __9__ or __10__ action. 9._____ 10._____

7. The first factor in aging is the __11__ of the meat. 11._____

8. In high-quality meat, enzymatic action stops __12__ than it does in __13__, low-quality meat. 12._____ 13._____

9. When the thin layer of moisture is removed from the surface of a carcass, the fat is exposed to __14__ and may become __15__. 14._____ 15._____

10. Enzymes __16__ a chemical reaction to take place, while __17__ take part in the reaction. 16._____ 17._____

11. Bacteria cells take __18__ shapes, __19__ of which are commonly known. 18._____ 19._____

12. Bacteria multiply by __20__, which takes place about every __21__ minutes. 20._____ 21._____

13. Three factors that constitute ideal conditions for growth of bacteria are __22__, __23__, and __24__. 22._____ 23._____ 24._____

14. The difference between fungi and other plants is that fungi contain no __25__, and they multiply by __26__. 25._____ 26._____

15. Molds are plant cells that are part of the __27__ family. 27._____

16. Unlike bacteria and yeasts, molds are made up of more than a __28__ __29__. 28._____ 29._____

17. Product contamination usually can be identified by 30 , 31 , and 32 . 30._____ 31._____ 32._____

18. Microbial discoloration is mainly responsible for making the product turn 33 . 33._____

19. The undesirable flavors of sausage products and processed meats may be described as 34 , 35 , or 36 . 34._____ 35._____ 36._____

20. Color, flavor, and juciness are factors that describe the 37 of a product. 37._____

UNIT C – SAUSAGE, CURED MEATS, AND CONVENIENCE FOODS

TOPIC 5 – STORAGE AND HANDLING

This topic, "Storage and Handling," is planned to provide answers to the following questions:

- Why are different temperatures used for fresh and smoked sausage?
- What are the primary factors to be considered in handling sausage products?
- What are some of the cooking methods, and why are they different for fresh sausage and smoked sausage?
- What are the basic steps in having a label approved?

Although sausage is inspected continuously at the plant level, the care of the finished product is equally important, especially after it leaves the manufacturer and before it reaches the consumer at the retail level.

Storage of Sausage Products

Sausages can be divided into many types, classes, and kinds of products. And each of the different sausage products usually requires a different temperature, humidity, and air circulation for proper storage. Some products, such as fresh pork sausage and head cheese, do not dry out as readily as other products and, therefore, are able to withstand temperatures as low as 32° F. with a circulation of air for good storage conditions.

In the case of smoked products, such as frankfurters and bologna, care must be taken that air circulation does not cause excessive drying. Temperatures between 40° and 140° F. are generally recognized as ideal conditions for the growth of bacteria; therefore, most sausage products are kept at a temperature below 40° F. to retard spoilage.

Handling of Sausage Products

Perishable items will keep longer if handling is kept to a minimum. The product is kept cool throughout the manufacturing process, except during smoking or drying. This practice of keeping the product cool before, during, and after delivery is also maintained after processing has been completed.

Fresh Sausage

Fresh sausage, including Italian- and country-style sausage in natural casings, must be cooked thoroughly. This class of sausage is usually produced in the form of links, bulk, rolls, or skinless links. Fresh sausage in natural casings are blanched sometimes in boiling water for 5 to 10 minutes before being fried, baked, or broiled. The blanching process helps to plump them, to partially cook them, and to allow the sausage to remain juicy while being thoroughly cooked. If the package label on fresh sausages indicates that they have been blanched, the process need not be repeated – only cooking is required before eating.

Large amounts of sausage may be baked in the oven at a temperature of 400° F. for about 20 or 25 minutes. German bockwurst and bratwurst are prepared sometimes by blanching and then browning in butter or fat. They may also be floured or breaded before browning. Italian-style fresh sausage may be blanched, or not, and prepared as a hot dish, sliced cold for appetizers, or cooked in wine or spaghetti sauces. The practice of "pricking" holes in the fresh sausage is frowned upon by most cooks because it allows the natural juices to escape. All fresh sausage should be cooked gently to prevent the casing from breaking open.

Smoked Sausage

Most smoked sausages are cooked and only need to be heated and served. Smoked sausage in casings should be cooked gently so that they do not burst. The generally recognized method of cooking frankfurters is to place them in cold water, bring them to a boil, and then remove them from the heat source and allow them to stand for 10 minutes before serving. Small or Vienna-style sausages or franks are sometimes cooked in various sauces such as barbecue, teriyaki, tomato, or cream sauces and served as snacks or hors d'oeuvres.

Sausages are usually chilled thoroughly before being moved from one place to another after they have been processed. The product must be handled quickly and as little as possible, especially at the retail level, when the meatcutter has it out of refrigeration while in the process of filling the display case.

Sausage products should not be stacked in refrigerator cases so that the top packages are at a higher temperature than those lower in the case. Also, the packages should not protrude too far on upright hanging display units for the same reason. Light also causes changes in the product, so the location of the lighting should be considered. Rotation of the products is also important. Off color or gas expanded packages should be removed. Code dates should be attended to when restocking display cases. Levels of light higher than 80-foot candles and temperatures over 35° F. cause rapid fading of the product.

Sausage Preparation

More than two hundred kinds of sausage are sold over the meat counter in the United States. And two hundred or more recipes are used to prepare these sausage products.

Even though the label on sausage items gives the method of preparation, the meatcutter is often asked how to prepare certain sausage products. He should always expect such questions from customers when sausage is put on sale.

The meatcutter should have a general knowledge of sausage cookery in order to answer questions that may be asked of him. He should be careful in answering the customer's questions when it is not known if the product is cooked or uncooked.

Luncheon Meats and Jellied Products

Luncheon meats and jellied products are usually served cold, but many preparations do require cooking. Jellied products are made with a gelatin that melts when heated. Large bologna and many loaves may be cut into thick pieces and baked, fried, or barbecued. Most sausage products go well with scrambled eggs, soufflés, or any other egg form. Blood sausage and blood puddings may be sautéed or browned in butter and served with sauerkraut, applesauce, vegetables, or mashed potatoes. Jellied products go well with certain vegetables when they are diced and molded in flavored or unflavored gelatin and served in colorful salad dishes.

Dry and Semidry Sausage

Dry and semidry sausages are usually served cold in many ways and with many foods, ranging from melons to pizza pies. This class of sausage is best sliced very thin because it has a tendency to be chewy when it is sliced too thick. Dry sausages are used not only on hors d'oeuvres and sandwiches but also in many hot dishes. Pepperoni and many other dry sausages are used for pizza. Other dry sausages, especially the semidry cervelats, are used in kabobs, fondues, or mixed with other meat and vegetable dishes as appetizers or main courses. Dry and semidry sausages are excellent when used in egg recipes. Chorizos are used in soups, stews, and countless Spanish-type dishes. Liver sausage is used in many recipes as the base for spreads and patés. It is often blended with one ingredient such as onion or garlic, or with mustard, mayonnaise, cream cheese, and sour cream, and may include chopped olives, pickles, relishes, or even other sausage products chopped into the spread, dip, or paté. Liver sausage dumplings are excellent when used in beef or vegetable soups.

Packaging and Labeling

All processed meat items that are packaged and labeled are inspected by the U.S. Department of Agriculture if they are to be sold in a state other than the one in which the items are produced. If an item is produced in California and is to be sold only within the state, it may be regulated by state inspection.

All labels on federally inspected meats must be approved by the USDA before they can be used on a product sold on the market. In order for a label to be approved, the following steps must be taken.

1. The processor must submit the label, the container, the formula, and the method of manufacture. In some cases a sample of the product is submitted.
2. Each part of the label must be checked for conformance with specifications and for accuracy. Labels may be rejected for not meeting specifications or other requirements, for omissions of certain words, or for improper use or failure to identify the method of processing.
3. If a product is produced in a container along with other material, such as brine or vinegar, it must be indicated on the label.
4. Geographical terms indicating a location other than where the product is produced must be qualified by words such as style, type, brand, and so forth. If a package label identifies a product as Italian-style salami, the product must be similar to the product produced in the country named on the label in this case, Italy. The product must also indicate the actual location in which it is produced; for example, "German-Style Salami—Made in California." If the product

is imported, the name of the country of origin must be shown on the label.

The following information must be included on labels submitted for approval:

1. The common name or one that describes the product
2. The official mark of inspection.
3. The net weight
4. The name and address of the manufacturer
5. The statement of ingredients if two or more are used
6. Any warning statement (keep frozen or cook before eating)
7. The size of each serving (if the number of servings is given)

If the label carries a picture, illustration, or drawing of the product, it must be an accurate representation that does not mislead the purchaser about the actual product. If something other than the product is shown in the illustration, or the illustration shows the product other than how it actually appears at purchase, the label must so indicate.

UNIT C – SAUSAGE, CURED MEATS, AND CONVENIENCE FOODS

TOPIC 5 – STORAGE AND HANDLING

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Proper storage practices must include control of __1__, __2__, and air __3__. 1._____ 2._____ 3._____

2. Sausage products are usually kept at a temperature below __4__ to help retard spoilage. 4._____

3. Before sausage products are moved from place to place, they are thoroughly __5__. 5._____

4. Light levels of __6__ foot candles can cause rapid __7__ of the product. 6._____ 7._____

5. More than __8__ different sausage products are sold in the United States. 8._____

6. The meatcutter should have a knowledge of sausage cookery so that he can __9__ the customer's __10__. 9._____ 10._____

7. Fresh sausages in natural casings are sometimes __11__ or __12__ in a little water for __13__ or __14__ minutes. 11._____ 12._____ 13._____ 14._____

8. The practice of pricking holes in fresh sausage is not recommended because the __15__ __16__. 15._____ 16._____

9. Frankfurters with natural casings are cooked gently so that they do not __17__. 17._____

10. Geographical terms indicating location other than where the product is produced must be qualified by words such as __18__, __19__, or __20__. 18._____ 19._____ 20._____

C1

UNIT D Mathematics

TOPIC 1 – ARITHMETIC REVIEW

This topic, "Arithmetic Review," is planned to provide answers to the following questions:

- **How are whole numbers added, subtracted, multiplied, and divided?**
- **What are the basic rules for working with fractions?**
- **What are the advantages of decimals?**
- **What is meant by the term percentage?**
- **What are compound numbers, and how are they used by the meatcutter?**

The apprentice meatcutter must have a good working knowledge of basic mathematics if he intends to succeed in his profession in the wholesale and retail meat industry. Problems involving whole numbers, fractions, decimals, percentages, and compound numbers are regularly encountered in the trade. Because of their importance to the apprentice, a review of these basic mathematical operations is presented in this topic.

Whole Numbers

An apprentice who needs a review of basic mathematics should start by doing some exercises involving the addition, subtraction, multiplication, and division of whole numbers, for he must be able to solve problems in these simple terms before he can go on to more complex ones. Whole numbers are numbers that do not contain fractions and that are not in themselves fractions.

Fractions

In solving the mathematical problems that are encountered in the meatcutting trade, the apprentice will often find it necessary to work with fractions as well as whole numbers. The term fraction means a part or portion of a whole. It is nearly impossible to use any form of measurement without having a way to express fractional parts.

A fraction may be expressed in three different ways without altering its value: as a common fraction (¾), as a decimal fraction (0.75), and as a percent (75%).

The common fractions are made up of a numerator and a denominator. The numerator and denominator are two numbers separated by a line that indicates division, the upper number being the numerator and the lower number the denominator.

Decimal Fractions

Decimal fractions—usually called simply "decimals"—are fractions in which only the numerator is expressed, the denominator being understood to be ten or some power of ten (100, 1,000, or 10,000, for example). In a decimal fraction, the value of the unexpressed denominator is indicated by the number of places to the right of the decimal point that are occupied by the expressed numerator. If the numerator occupies only one place to the right of the decimal point, the denominator is understood to be ten ($0.5 = {}^{5}/_{10}$). If the numerator occupies two places to the right of the point, the denominator is understood to be 100 ($0.58 = {}^{58}/_{100}$). If the numerator occupies three places to the right of the point, the denominator is 1,000 ($0.703 = {}^{703}/_{1,000}$), and so forth.

Decimals, like common fractions, provide a means of expressing quantities that are less than one, but they have the advantage of being easier to work with than common fractions. However, in making calculations involving decimals, care must be taken to place the decimal point correctly; an error in placement introduces a significant change in the value of the decimal number.

Percent

The word "percent," an abbreviation of the Latin "per centum," literally means "for each hundred" or "by the hundred." "Percentage" means the method of expressing a part of a whole as hundredths of a whole. Thus, 12 percent means

12 parts of a whole that is thought of as consisting of 100 such parts; 100 percent means all 100 parts of the whole taken together; and 108 percent means all 100 parts of the whole plus 8 more such parts.

Since percents are expressions of the parts of a whole, they can be converted to common fractions or decimals: 12 percent is equivalent to $^{12}/_{100}$ or 0.12, 100 percent is equivalent to $^{100}/_{100}$ or 1.0, and 108 percent is equivalent to $^{108}/_{100}$ ($1^{8}/_{100}$). It can be seen that percentages greater than 100 become mixed numbers in such conversions.

Compound Numbers

The meatcutter frequently must solve problems involving the addition, subtraction, multiplication, and division of compound numbers, which are expressions containing two or more unlike but related units of measure, such as 4 pounds 3 ounces or 2 feet 3 inches. Each of the two or more parts of a compound number is called the denominate number. In the examples given above, 4 pounds 3 ounces, and 2 feet 3 inches are denominate numbers.

Except in the case of the simplest addition and subtraction problems, the reduction (changing) of related but unlike units is an essential step in working with compound numbers. This is so because only like units can be combined in arithmetical operation. After this reduction has been accomplished, operations involving compound numbers can be performed in the conventional way.

The study assignment for this topic contains the information needed for this review of mathematics and includes many problems involving basic operations with whole numbers, fractions, decimals, percentages, and compound numbers.

Study Assignment

Glenn M. Hobbs and James McKinney, *Practical Mathematics* (Third edition). Chicago. American Technical Society, 1973. Complete practice problems assigned by instructor.

UNIT D – MATHEMATICS

TOPIC 1 – ARITHMETIC REVIEW

Study Guide

Complete each of the mathematical exercises presented below, and write the correct answer in the corresponding blank at the right.

Find the sum:

1. $49 + 98 =$ 1._____
2. $504 + 929 =$ 2._____
3. $234 + 777 =$ 3._____
4. $\$1.16 + 2.31 =$ 4._____
5. $\$1.01 + 100.00 + 9.09 =$ 5._____
6. $\$1.12 + 1.24 + 1.05 + 3.67 =$ 6._____
7. $\$2{,}001.00 + 998.39 + 1{,}002.60 =$ 7._____
8. $\frac{1}{4} + \frac{1}{2} + \frac{5}{8} =$ 8._____
9. $1\frac{2}{3} + 3\frac{2}{9} =$ 9._____
10. $4\frac{1}{4} + 5\frac{2}{3} =$ 10._____

Find the difference:

11. $67 - 58 =$ 11._____
12. $89 - 79 =$ 12._____
13. $113 - 98 =$ 13._____
14. $\$0.19 - 0.08 =$ 14._____
15. $\$0.37 - 0.18 =$ 15._____
16. $\$1.23 - 0.67 =$ 16._____
17. $\$11.37 - 10.27 =$ 17._____
18. $\frac{2}{3} - \frac{1}{2} =$ 18._____
19. $\frac{5}{9} - \frac{1}{2} =$ 19._____
20. $\frac{5}{6} - \frac{2}{3} =$ 20._____

Find the product:

21. 567 × 7 = 21. _____
22. 506 × 3 = 22. _____
23. $5.37 × 8 = 23. _____
24. $50.37 × 9 = 24. _____
25. $98.21 × 8 = 25. _____
26. 54,021 × 5 = 26. _____
27. $\frac{4}{3} \times \frac{6}{5}$ = 27. _____
28. $\frac{3}{2} \times \frac{3}{2}$ = 28. _____
29. $1\frac{1}{2} \times 1\frac{1}{2}$ = 29. _____
30. $2\frac{2}{3} \times 2\frac{3}{4}$ = 30. _____

Find the quotient:

31. 18 ÷ 9 = 31. _____
32. 567 ÷ 7 = 32. _____
33. 8,109 ÷ 9 = 33. _____
34. 13,482 ÷ 42 = 34. _____
35. $2,632 ÷ 56 = 35. _____
36. $141.47 ÷ 3.29 = 36. _____
37. $137.34 ÷ 2.10 = 37. _____
38. $\frac{2}{3} \div \frac{1}{8}$ = 38. _____
39. $\frac{9}{10} \div \frac{2}{5}$ = 39. _____
40. $6\frac{2}{3} \div 2\frac{1}{3}$ = 40. _____

Change to decimals:

41. 5% 41. _____
42. 30% 42. _____
43. 37.5% 43. _____
44. 84% 44. _____
45. 110% 45. _____

Change to percent:

46. 0.07 46. _____

47. 0.19 47. _____

48. 1.34 48. _____

49. 0.435 49. _____

50. 0.0036 50. _____

Reduce to lowest terms:

51. $\frac{2}{4}$ = 51. _____

52. $\frac{6}{8}$ = 52. _____

53. $\frac{3}{9}$ = 53. _____

54. $\frac{6}{12}$ = 54. _____

55. $\frac{6}{54}$ = 55. _____

Change to mixed numbers:

56. $\frac{9}{8}$ = 56. _____

57. $\frac{4}{3}$ = 57. _____

58. $\frac{5}{2}$ = 58. _____

59. $\frac{13}{10}$ = 59. _____

60. $\frac{9}{7}$ = 60. _____

Express as common fraction:

61. 50% 61. _____

62. 25% 62. _____

63. 10% 63. _____

64. 80% 64. _____

65. 90% 65. _____

Solve measure problems:

66. 1 lb. 8 oz. + 13 oz. = 66. _____

67. 4 lbs. 2 oz. X 6 = 67. _____

68. 5 lbs. 2 oz. — 2 lbs. 6 oz. = 68. _____

69. 10 ft. 3 in. + 3 ft. 10 in. = 69. _____

70. 8 ft. 5 in. — 5 ft. 7 in. = 70. _____

UNIT D – MATHEMATICS

TOPIC 2 – PERCENTAGES

This topic, "Percentages," is planned to provide answers to the following questions:

- **What is the difference between markup and gross profit?**
- **How is the percent of the cut found?**
- **How is a meatcutting test performed?**

The purpose of this topic is to help the apprentice meatcutter improve his knowledge and skill in pricing meat. In the past the meatcutter, manager, or store owner would guess at prices, but he could not be sure of the exact results. However, with the increase in prices over the years, it became very important, and in fact critical, to maintain an exacting control of inventory and profit. This topic presents step-by-step instructions on how the apprentice meatcutter should control and manage his dollars or the dollars of his employer.

Meat Industry Terminology

The apprentice meatcutter will encounter many different terms throughout his career in the meat industry. If he understands these terms, he will be able to understand and interpret variations of the terminology used throughout this topic.

Percent of Markup

The percent of markup is the percent the cost price is of the dollar profit.

Problem: Find the percent of markup when the selling price is $2.00 and the cost is $1.50.

Step 1. Subtract the cost from the selling price to find the dollar profit:

$2.00 – 1.50 = $0.50 dollar profit

Step 2. Divide the dollar profit by the cost to obtain percent of markup:

$$150\overline{)50.00} \quad 0.33 \text{ or } 33\% \text{ of markup}$$

Cost Percent

Cost percent is the percent the cost is of the selling price. To find cost percent, subtract the percent of selling price from 100 percent.

Problem. Find the cost percent when the percent of selling price is 20 percent.

100% selling price
– 20% of selling price
80% cost

Percent of Cut

The percent of cut is the percent the cut is of the whole.

Problem: Find the percent of cut when the weight of the whole is 300 pounds and the weight of the cut is 45 pounds.

Divide the weight of the cut by the weight of the whole:

$$300\overline{)45.00} \quad 0.15 \text{ or } 15\% \text{ of cut}$$

Percent of Selling Price

Percent of selling price or gross profit percent is the percent the dollar profit is of the selling price.

Problem: Find the percent of selling price when the selling price is $2.00 and the cost price is $1.50.

Step 1. Subtract the cost price from the selling price to find the dollar profit:

$2.00 – 1.50 = $0.50 dollar profit

Step 2. Divide the dollar profit by the selling price to find percent of selling price:

$$200\overline{)50.00} \quad 0.25 \text{ or } 25\% \text{ of selling price}$$

Selling price

The selling price is made up of two factors. cost and profit. The items the meatcutter works

with are usually expressed in terms of percentage. When referring to percentage in relation to selling price, cost and profit take on new names. cost percent and percent of gross profit.

Problem Find the selling price when the percent of selling price (percent of gross profit) and cost are known. For this problem the percent of selling price is 20 percent and the cost is $0.40.

Step 1. Subtract the percent of selling price from 100 percent to find the cost percent:

100% − 20 = 80% cost

Step 2 Divide the cost by the cost percent to find the selling price

$0.50 - selling price
80 | 40.00

Meatcutting Test

At this point the apprentice meatcutter may ask why he needs to know anything about cutting tests. He should realize that if two men of equal cutting ability are selected for promotion to head meatcutter, the one with the most technical knowledge will be the most likely candidate. Therefore, this discussion of cutting tests is intended to prepare the apprentice meatcutter for promotion if and when the opportunity arises.

For this particular test, the apprentice meatcutter should prepare a table like the one shown as Table D-1. Each of the columns will be completed in a step-by-step fashion as the cutting test is performed throughout the topic.

Seventeen pounds of pork loin have been purchased at a cost of 40 cents per pound for use in this test. After the meat has been fabricated into retail cuts, the apprentice meatcutter should weigh each cut. The weight of each cut should then be listed in the weight column of the table. Once these steps have been completed, the apprentice should proceed with the meatcutting test in the following manner:

Step 1. Find the total cost of the pork loin by multiplying the total weight times the cost per pound.

17 lbs. × $0.40 = $6.80 total cost

Step 2. Compute and fill in the estimated selling price for each of the cuts listed in Table D-1 after the prices for the same cuts have been checked at other markets in the area. The prices may be adjusted at a later time to give the desired gross profit.

Step 3. After the selling price has been adjusted, find the return on each cut by multiplying the estimated selling price of each cut by the weight of each cut.

Rib end ..... 4 lbs. × $0.59 = $2.36
C.C. Chops .... 10 lbs. × $1.09 = $10.90
Loin end ..... 3 lbs. × $0.69 = $2.07

Step 4. Total the selling prices of the individual cuts to find the selling price of the whole pork loin.

$2.36 + $10.90 + $2.07 = $15.33 total selling price

Step 5. In Step 1 the cost of the whole pork loin was estimated to be $6.80, and in Step 4 the total selling price of the whole was determined to be $15.33. Now compute the gross dollar profit, or find how much money was made with the estimated selling price on the whole. This is done by

TABLE D-1

Pork Loin Cutting Test

Item	Weight (lbs.)	Estimated selling price	Total selling price	Cost	Adjusted selling price	Total selling price	Percent of cut	Yield	Factor
Rib end	4	0.59	2.36	0.26	0.33	1.32	0.2353	0.0776	0.6535
C.C. chops	10	1.09	10.90	.0.48	0.61	6.10	0.5882	0.3588	1.2079
Loin end	3	0.69	2.07	0.31	0.39	1.17	0.1765	0.0688	0.7723
Total	17		15.33 −6.80			8.59	1.0000	0.5052	

$ 8.53 Gross profit

subtracting the cost of the whole from the selling price of the whole.

$15.33 – 6.80 = $8.53 gross dollar profit

Step 6. Now that the selling price, cost price, and dollar profit have been established, find the percent of selling price, which is the gross profit percent that the estimated selling prices will earn. To find it, divide the gross dollar profit by the selling price. The percent of selling price should be rounded off no less than four places so that the test is accurate.

55.64% of selling price
15.33 | 8.5300 00

Step 7. Steps 7 and 8 deal with finding the cost of each cut for adjustment of the selling price. The first step in finding the cost is to determine the percent of markup or cost percent. The meatcutter knows that the percent of selling price is 55.64 percent and that every selling price is made up of profit and cost. In this case, the selling price is 100 percent; therefore, the percent of selling price is subtracted from 100 percent and the remainder is the cost percent.

100% – 55.64 = 44.36% cost

Step 8. Find the cost of each item listed in Table D-1 by multiplying the cost percent (44.36%) by the estimated selling price of each item.

Rib end ..... $0.59 X 44.36% = 26.1724 or $.26
C.C.Chops .... $1.09 X 44.36% = 48.3524 or $.48
Loin end ..... $0.69 X 44.36% = 30.6084 or $.31

Step 9. The meatcutter is subsequently instructed to make his prices more competitive by lowering the gross profit. This is accomplished by subtracting the desired percent (21%) from 100 percent, which gives a new cost percent.

100% – 21 = 79% cost

After the new cost percent has been determined, it is divided into the cost per pound listed for each item in Table D-1 to find the new adjusted selling prices.

Rib end ..... 0.26 ÷ 0.79 = 0.329 or $0.33
C.C. Chops .... 0.48 ÷ 0.79 = 0.608 or $0.61
Loin end ..... 0.39 ÷ 0.79 = 0.392 or $0.39

Step 10. After the selling prices have been adjusted to give a gross profit of 21 percent, the meatcutter can use the procedures used in Steps 3 and 4 to find the selling price of each item and the whole. He should remember to use the adjusted selling price rather than the estimated selling price for each item.

Rib end ..... 4 lbs. X $0.33 = $1.32
C.C. Chops .... 10 lbs. X $0.61 = $6.10
Loin end ..... 3 lbs. X $0.39 = $1.17

The new selling price of the whole is then found by adding the new selling prices of the items.

$1.32 + $6.10 + $1.17 = $8.59 total selling price

Step 11. To find the yield, the meatcutter must first find the percent of cut. It is found by dividing the weight of each individual cut by the weight of the entire carcass. The meatcutter should remember that in finding percent the larger number is divided into the smaller number. Also, the percent of cut obtained for each item should total up to 100 percent.

Rib end ..... 4 lbs. ÷ 17 lbs. = 0.2353%
C.C. Chops .... 10 lbs. ÷ 17 lbs. = 0.5882%
Loin end ..... 3 lbs. ÷ 17 lbs. = 0.1765%

Step 12. The next column in Table D-1 is yield percent, which is found by multiplying the percent of cut by the adjusted selling price.

Rib end ..... 0.33 X 0.2353 = 0.077649%
C.C. Chops .... 0.61 X 0.5882 = 0.35880%
Loin end ..... 0.39 X 0.1765 = 0.068836%

After the yield percent has been calculated for each cut, the next step is to find the total yield percent. The total of this column is the average selling price of pork loin (Table D-1).

The meatcutter should make a simple check at this time to make sure that he has obtained the desired percent of selling price (21%). Since the yield total (0.50528) is the average selling price per pound, he can subtract the cost per pound ($0.40) and get the profit ($0.105). Then, he must divide the average price per pound ($0.505) into the profit per pound ($0.105) to find the percent of selling price.

0.10500 ÷ 0.505 = 21% of selling price

Step 13 The final step involves finding the factor of each item. The total yield or average

selling price should be rounded off to three places (0.505) and then divided into the adjusted selling price of each of the items listed in Table D-1.

Rib end ..... 0.330000 ÷ 0.505 = 0.6535
C.C. Chop ..... 0.610000 ÷ 0.505 = 1.2079
Loin end ..... 0.390000 ÷ 0.505 = 0.7723

Study Assignment

Glenn M. Hobbs and James McKinney, *Practical Mathematics* (Third edition). Chicago: American Technical Society, 1973. Complete practice problems assigned by instructor.

UNIT D – MATHEMATICS

TOPIC 3 – COMPUTING PRICES

This Topic, "Computing Prices," is planned to provide answers to the following questions:

- How is the selling price computed after the wholesale price is increased?
- How does management determine a selling price that will provide the desired gross profit?
- Why are all items of operational costs figured in terms of percent?

The objective of a business is to make a profit. The meatcutter must always be aware of his competition's selling prices, particularly the advertised prices. He must be able to determine the most advantageous selling prices. The cost of meat is established by the packer and usually varies from day to day. However, the selling price is established by market management, and it must be consistent with existing competitive prices in the area where the market is located.

No foolproof formula is available for use in establishing a workable price structure. After a price structure has been established, it may work for only a short time because of the many variables involved. It is affected daily by changes in merchandise and operational costs. These changes must be reflected in the price structure or the market will suffer a loss of either sales volume or profits.

Price Factors

Three factors that make up the selling price of an item are the cost of the merchandise, operational costs, and the desired net profit. The success or failure of a market depends mainly on one factor: net profit. Every operation in the meat business is geared to making a profit. The manner in which the meatcutter performs these operations—from the initial selection and purchase of meat from the packer or breaker to the final sale to the customer—is reflected in the amount of profit the business earns. The success of a market is determined by the ability of management to compute realistic prices that reflect a reasonable profit and at the same time ensure a sales volume necessary to remain in the business.

Determining Costs and Profit

Meat that is to be sold at the retail level is priced by (1) determining the cost of the meat; (2) determining the operational costs of the business, and (3) estimating a satisfactory net profit. Upon completion of these steps, individual calculations and adjustments are made to arrive at practical, specific selling prices.

Primal Cut Costs

The meatcutter must develop an accurate method for finding the cost per pound of every primal cut of meat so that he can calculate competitive selling prices that reflect a reasonable profit and that do not cut volume beyond the desirable point.

A retailer who buys carcass beef must know what percent the primal cut is of the carcass. He must also know the cost of primal cuts in case he has to purchase more of them from the breaker. The retailer often has to buy primal cuts to effect an even flow of sales from carcass beef. This practice is followed so that the market is never out of retail cuts or is not overstocked with certain retail cuts, which might be the case if only straight sides of beef were purchased.

In determining the cost of a primal cut from a carcass, the replacement price charged by the breaker for the same primal cut is usually used as a basis because it is always the greater of the two costs. For example, if the packer charges 79 cents per pound for a side of beef and the breaker charges 95 cents per pound for rounds, the cost of rounds from carcass beef is considered to be 95 cents when only rounds are purchased from the breaker.

Carcass beef usually provides approximately 2 percent more profit than primal cuts but only if all cuts from the carcass move evenly. Furthermore, the additional labor costs involved in handling sides of beef may offset any increase in profits. The meatcutter must consider existing market conditions before he decides whether to handle sides of beef or primal cuts.

Operational Costs

Before deciding how much profit to build into the price structure, the meatcutter must first know all of the costs involved in his business. Operational

costs are usually fixed costs that are relatively stable. They include such things as rent, power, wrapping, advertising, labor, and miscellaneous expenses. The cost of meat shrinkage, which is often overlooked, should also be added to these costs. Once all the costs have been determined, and the amount of net profit has been decided upon, it is possible to establish the percent of gross profit necessary for the operation.

Operational costs should be calculated as a percent of the total sales. Also, the percent of profit should be based on the selling price of the merchandise rather than the cost price, so that all percentages are related to the same base. An erroneous picture is provided when operational costs are calculated on total sales, and the percent of profit is calculated on the cost of the merchandise. Sales rather than cost are used uniformly for all profit calculations in the meat business. Any quoted percent is always presumed to be based on sales, not cost.

Table D-2 lists the basic operational costs for a business that has a total sales of $15,000 for a given period of time.

The cost of shrinkage, which usually ranges from 5 to 8 percent, must be added to the basic operational costs to obtain total operational costs. Shrinkage is the difference in the weight of a carcass or primal cut between the time it is purchased and the time it is processed into retail cuts. Every percent of shrinkage prevented will add an equal percent to net profit. If, for example, shrinkage is held to 5 percent through careful handling and good refrigeration equipment, this figure must be added to the basic operational costs to find the total operational costs.

Operational costs	23%
Shrinkage	+ 5
Total cost	28%

TABLE D-2

Basic Operational Costs

Item	Cost	Percent of sales
Rent	$ 750.00	5
Power	150.00	1
Wrapping	300.00	2
Advertising	450.00	3
Labor	1,500.00	10
Miscellaneous	300.00	2
Total	$3,450.00	23%

In this case the percent of gross profit, or markup, as it is usually called, must be more than 28 percent to show any net profit. This percentage may seem high, but many operators have lost money because their operational expenses were higher than they had anticipated.

Net Profit

A successful operator must realize a net profit that is sufficient to build up a reserve. A generally accepted net profit is about 4 percent. When this figure is added to the total cost of operation, as shown below, it gives the markup needed to cover all costs and net profit.

Total operational costs	28%
Desired net profit	+ 4
Necessary gross profit	32%

Pricing Procedures

The meatcutter computes cost price and gross profit with systems set up for this purpose. However, he usually finds that he needs more than mathematical systems to arrive at effective selling prices. He must also consider customer preferences, seasonal sales, inventory control, and volume versus profits.

Consumer preferences are determined by the economic status of the neighborhood and by the dietary habits of the people. Seasonal sales are influenced by an increase in demand for merchandise that is traditionally associated with a holiday or a certain time of year. These products are usually offered at a lower margin of profit that is offset by the increase in sales volume.

The easiest, quickest, and most effective method used to offset a change in the movement of meats is an adjustment in selling prices, which involves the question of volume versus profit. Pricing begins with the primal cuts and proceeds to the retail cuts. Adjustments such as those mentioned above are usually made when the prices are computed for the retail cuts.

Pricing Primal Cuts

In determining selling price, the cost of the primal cuts is found first by multiplying the weight times the purchase price per pound. For example, if 90 pounds of round cost 95 cents per pound, the total cost is found as follows:

90 lbs X $0.95 = $85.50 total cost

If the necessary gross profit is 32 percent, the meatcutter must then establish a total selling price

that will reflect this amount of profit. The total selling price is not found by taking 32 percent of $85.50 and adding it to $85.50. If it was done in this manner, the percent of profit would be based on cost rather than selling price. To establish the selling price, the meatcutter must subtract the desired percent from 100 percent and then divide the total cost by the remaining percent.

Selling price	100%
Gross profit	− 32
Cost	68%

$125.73 = selling price
68 | 8550.00

The round must be sold for $125.73 to obtain a 32 percent gross profit. However, before the round can be sold, it must be reduced to various retail cuts, which are priced individually so that they will add up to $125.73.

Pricing Retail cuts

Because of the different cutting procedures used in meat markets, a cutting test must be performed to determine the yield of each type of primal cut on hand. For the test, the round is cut and the retail cuts are trimmed and weighed. The weight of the retail cuts is then divided by the total weight of the primal cut to determine the yield or the percent of the cut. For example, if the weight of top round steaks is 15.3 pounds and the total weight of the round is 90 pounds, the yield is calculated as follows:

0.17 or 17% = yield of cut
90 | 15.30

After the percent of yield has been determined, the same grade of round can be used thereafter with the same cutting procedure. The meatcutter should be able to determine the number of pounds of retail cuts he can obtain from rounds of different weights without having to perform cutting tests on each round. In establishing a yield percent, however, it is better to base it on the average of several cuttings rather than on just one to compensate for the differences in the physical structure of rounds of different weights.

When the weights of the various types of retail cuts are known, the selling price that will provide the necessary gross profit can be set for each cut. Table D-3 summarizes the selling prices and percent of yield for each retail cut from the round.

To find the percent of gross profit earned from the whole round, the meatcutter must first subtract the cost of the whole round from the total selling price and obtain the gross profit.

Selling price	$125.73
Cost	−85.50
Gross profit	$ 40.23

The percent of gross profit is then obtained by dividing the gross profit by the total selling price as follows:

0.32 or 32% of gross profit
12573 | 4023.00

Retail Price Factors

In determining retail prices, a number of factors must be considered. First, the meatcutter should realize that he does not have to maintain the same percent of markup on each retail cut, but

TABLE D-3
Meat Pricing Data

Retail cut	Weight, lb	Price/lb	Total price	Yield, %
Top round	15.3	$1.98	$30.44	17
Rump	13.5	1.59	21.47	15
Sirloin tip	15.3	1.99	30.44	17
Bottom round	11.7	1.77	20.71	13
Stew meat	9.0	1.49	13.41	10
Ground meat	6.3	1.47	9.26	7
Waste	18.9	–	–	21
Total	90.0 lb.		$125.73	100%

he must maintain it on all retail cuts from any one primal cut. He can adjust the selling prices of the different retail cuts so that he gets more than 32 percent markup on certain retail cuts and less than that on other cuts. In deciding how to adjust these prices, the meatcutter must take into consideration the competition's prices and the preferences of the immediate neighborhood.

The selling prices given in Table D-3 are based on an ideal situation, where all retail cuts sell equally well. However, as every meatcutter soon discovers, some cuts move much faster than other cuts, and certain unsold cuts become "shop work" or leftovers. He must sell these cuts before they spoil. Therefore, the next step in computing prices is learning how to make additional adjustments for leftover cuts without sacrificing profit.

From the retail cuts itemized in Table D-3, assume that top round is selling slowly, while sirloin tip is moving briskly. Because the yield from the primal resulted in the same weight for each of these retail cuts, and the original selling price for each was the same, the meatcutter should have no difficulty in adjusting his price structure. He could, for example, lower the price of top round to $1.95 per pound and raise the price of sirloin tip to $2.03 per pound. These prices would result in a loss of 61 cents on top round but would give a corresponding gain of 61 cents on sirloin tip. Therefore, the gross profit would remain unchanged.

Unfortunately for the meatcutter, adjustments are not always so easy to make. Using Table D-3 again, assume that top round is moving too slowly but that stew meat and ground meat, which together total 15.3 pounds, are moving rapidly and, therefore, will have to make up the loss. The meatcutter can drop the price of top round to $1.88 per pound, resulting in a loss of $1.53. To compensate for this loss, he can increase the price of stew meat to $1.59 per pound, providing a gain of 90 cents. He can also increase the price of ground meat to $1.57, giving a gain of 63 cents. The net gain of the two price increases amounts to $1.53, which covers the loss on top round.

The meatcutter must make additional computations when the weights of the cuts to be adjusted are not the same. For example, assume that rump roast is the slow selling cut and that stew meat is the fast selling cut. If the price of the 13.5 pounds of rump roast that were originally priced at $1.59 per pound was reduced by 6 cents per pound, it would result in a loss of 81 cents. However, if the price of the 9 pounds of stew meat that were originally priced at $1.49 per pound was increased by 9 cents per pound, it would result in a gain of 81 cents, thereby making up for the loss on rump roast.

The most important point to remember in adjusting prices is to recover the total loss in money, which must be figured on the basis of the total weight of the cuts involved as well as the selling price of each cut.

UNIT D – MATHEMATICS

TOPIC 4 – METRIC MEASUREMENT

This topic, "Metric Measurement," is planned to provide answers to the following questions:

- **What are the differences between the English system of measurement and the metric system?**
- **What are the advantages of the metric system?**
- **How will the introduction of the metric system affect the wholesale and retail meat industry?**

Systems of Measurement

The two commonly accepted systems of measurement are the English system and the metric system. The English system is the measurement system used extensively in the United States and Great Britain. The metric system, which is based on the decimal system and is therefore easier to work with, is the common system of measurement in most other parts of the world.

The English System

In the familiar English system, length is measured in inches, feet, and yards; area is measured in square inches, square feet, and square yards; volume is measured in cubic inches, cubic feet, and cubic yards (cubic measure) or in ounces, quarts, and gallons (liquid measure); and weight is measured in ounces, pounds, and tons.

The Metric System

The metric system of measurement is used for nearly all scientific work in the United States as well as abroad, and most foreign countries use the metric system for industry as well as for science. The conversion to metrics is under way in American industry, and although the United States has not yet officially replaced the English system with the metric system, the changeover is certain to come.

In the metric system, measurements of length, area, and volume (cubic measure) are based upon the meter, which is slightly more than a yard; measures of weight are based upon the kilogram, which is about 2⅕ pounds; and measures of capacity are based upon the liter, which is slightly more than a U.S. quart (liquid measure). All of the larger and smaller units of measurement the centimeter, the kilometer, and the gram, for example are multiples or submultiples of 10 with respect to the basic units. The millimeter is $\frac{1}{1000}$ of a meter, the centimeter is $\frac{1}{100}$ of a meter, and the kilometer is 1 000 meters. Each of these terms is made up of the word "meter" with a different prefix. These prefixes are used not only for units of length but also for other measurements in the metric system. The number values of the prefixes milli-, centi-, and kilo- should be memorized; the following table will be useful as a reference for the others.

TABLE D-4

Metric Prefixes

Giga-	1 000 000 000
Mega-	1 000 000
Kilo-	1 000
Hecto-	100
Deka-	10
Deci-	$\frac{1}{10}$ or 0.1
Centi-	$\frac{1}{00}$ or 0.01
Milli-	$\frac{1}{1,000}$ or 0.001
Micro-	$\frac{1}{1,000,000}$ or 0.000001
Nano-	$\frac{1}{1,000,000,000}$ or 0.000000001

Time. The standard unit of time in both the metric system and the English system is the second. The second has been defined as $\frac{1}{86,400}$ of the mean solar day, the mean solar day is the average time it takes the earth to make one complete revolution on its axis. This definition of the second has recently been supplanted by a more accurate one based upon the transition period between two levels of energy in the cesium - 133 atom.

Weight. The standard unit of mass in the metric system is the kilogram. Although the kilogram is the unit of mass, it is commonly used also as a unit of force or weight. (Mass is a quantity of matter; weight is the force with which a body is attracted to the earth.) The standard kilogram on which mass measurements are based is a cylindrical block of platinum-iridium that is preserved in France. Its

mass is equal to that of 1 000 cubic centimeters of water at 4° C.

Converting English and Metric Measurements

It is often necessary to convert measurements from the English system to the metric system or vice versa. No uniform relationship exists between the two systems, but nearly exact equivalents of units can be given. Table D-5 contains some of the more important conversion factors.

Study Assignment

Fred J. Helgran, *Metric Supplement to Science and Mathematics* (Revised edition). Oak Lawn, Ill. Ideal School Supply Co., 1973. Read pages assigned by instructor.

TABLE D-5

Conversion of Measurements

Metric to English			English to metric		
Metric		English	English		Metric
1 meter	=	39.37 inches			0.0254 meter
1 decimeter	=	3.937 inches			0.254 decimeter
1 centimeter	=	0.394 inch	1 inch	=	2.54 centimeters
1 millimeter	=	0.039 inch			25.4 millimeters
1 kilometer	=	0.62 mile	1 foot	=	0.3048 meter
1 gram	=	0.035 ounce	1 yard	=	0.9144 meter
1 kilogram	=	2.2 pounds	1 mile	=	1.60934 kilometers
1 liter	=	1.057 quart (liquid meas.)	1 pound	=	454 grams
			1 quart	=	0.946 liter

UNIT D – MATHEMATICS

TOPIC 4 – METRIC MEASUREMENT

Study Guide

Determine the correct word for each numbered blank in the sentence, and write that word in the corresponding blank at the right.

1. The metric system is a __1__ system in which all units of measurement are based on multiples of __2__. 1. _____ 2. _____
2. Measures of capacity are based upon the __3__. 3. _____
3. The standard metric unit for measurement of length is the __4__. 4. _____
4. In the metric system, the kilogram is the standard unit for measurement of __5__. 5. _____
5. One pound equals __6__ grams. 6. _____
6. One kilogram equals __7__ pounds. 7. _____
7. One gram equals __8__ ounce. 8. _____
8. One ounce equals __9__ grams. 9. _____
9. One liter equals __10__ quarts. 10. _____
10. One meter equals __11__ inches. 11. _____

UNIT E Meat Packaging and Handling

TOPIC 1 — PURPOSE OF MEAT PACKAGING

This topic, "Purpose of Meat Packaging," is planned to provide answers to the following questions:

- Why is meat packaged?
- What are the different methods of packaging meat?
- What is the purpose of packaging in different ways?

Meat is packaged by both the service and the self-service market to make it convenient to carry and to keep it sanitary during transit from the market to the home. The service market packages meat after it has been sold, while the self-service market packages meat before it is sold.

The self-service market uses materials and methods of packaging to promote the sale of meat. For example, various types of wrapping materials are used to make the package attractive, to permit the customer to examine the contents, to provide sanitary conditions for handling, and to give the customer the information he needs about the contents.

Customer Convenience

Meat is packaged so that the customer can (1) inspect the various cuts of meat on display, and (2) carry it home in a sanitary manner.

Handling

Packaged meats are convenient for the customer to handle. They can be put in a bag with other food without having the meat pick up odors or off-flavors from other food or causing other food to spoil. Also, the containers usually provide a convenient means for storing the meat until it is used by the customer.

Inspection

Customers select meat on the basis of careful inspection. Meat, unlike many other foods, cannot be sold just by labels. This fact was proven by one producer of frozen steaks who tried to market frozen steaks by packaging them in cardboard boxes that carried labels with pictures of steaks. The venture was almost a complete failure. He then tried packaging steaks in cellophane and turned near failure into success. In fact, he is now one of the leading producers of frozen steaks.

The customer is looking for several things when he inspects a package of meat. He is looking for freshness, fat, and amount of bone left on the meat. He is also looking to see how thick the meat has been cut and how many pieces are in the package. Customers not only want fresh, well-trimmed meats, but they also want variety in sizes as well as in cuts of meats.

Customers who do not find the number of pork chops they want in a package or the thickness they want in packaged steaks often leave the market without talking to the meatcutter. Their business is lost. Customers who inform the meatcutter of their needs must be given special service. The market should therefore try at all times to keep a sufficient variety of packaged meats of the kind, the thickness, and the number in a package that will satisfy almost every customer.

Seller Convenience

Meat is packaged so that the seller can (1) handle it in a sanitary manner; (2) display it for inspection by the customer, and (3) preserve it for various purposes and periods of time.

Handling

Wrapping or packaging meat saves the meatcutter in the service market from having to be continually cleaning case tops, display windows, floors, and so forth. It also enables the meatcutter to store orders uhtil they are picked up by the customer.

The advantages of packaging meats are even greater in self-service than in service markets. The major reason for the success of the self-service market is that customers do not have to stand in line and wait to be served by meatcutters, but they select from prepackaged meats in the display case. By prepackaging meat for sale, self-service markets are able to meet the demands for meat during the peak hours of business or high-volume weekend days. All smoked meats are wrapped during the first part of the week when business is comparatively slow. The weekends are then free for processing and packaging fresh meats nearer to the time they will be sold. The success of a self-service market depends primarily upon having enough meat packaged ahead of time to meet all demands that arise, but never too much packaged so that the meats become discolored before they can be sold.

Displaying

The one big advantage a service market has over a self-service market is that the the meatcutter can offer a personalized type of salesmanship. In a self-service market the packaged meat sells itself. The package that is attractive, inviting, and contains the right amount of meat gives the self-service market greater selling power. Recognition of these facts by the highly competitive markets in the self-service retail meat business has brought about a continual search for better wrapping materials, better wrapping equipment, and better wrapping methods. Markets are constantly working to obtain colorful, durable, and airtight packages that can be produced rapidly and without excessive costs.

Large attractive displays have proved that they sell more merchandise than small ones. These displays have become a standard means of merchandising or pushing items in highly competitive markets. The displays contain not only a large number of packages but also packages of various sizes, which give the customer the impression that he can get all the merchandise he wants and in any size he desires.

Preservation

Wrappings of different kinds are used to preserve meats for various purposes and periods of time. Wrapping meat for preservation in the average retail meat market is generally only a short-term measure fresh meats for 3 days and smoked meats for 7 days. Smoked meats actually keep better if they are not wrapped because moisture collects inside the wrapper and eventually causes them to mold. When fresh meats are wrapped by the methods and with the materials used by retail markets, they are in danger of spoiling after three days unless they are frozen.

Customers should be advised that fresh meat must be placed in the meatkeeper of their refrigerator if they do not intend to use it within three days after it is purchased. If the meat is not placed in the meatkeeper, the juices that accumulate in the bottom of the package may sour, or the gas that accumulates in the package may give the meat a bad odor and flavor.

Wrapping fresh meats for short-term display preserves the flavor and food value. It keeps meats from drying out and from losing their natural juices, which contain much of the flavor and a certain amount of the food value. Wrapping also preserves the bloom or natural color of the meat. Unwrapped, meat will become dark and discolored within a few hours. Although the meat is not spoiled for eating, the color does destroy its eye-appeal and reduces the chances of a profitable sale.

As far as the customer is concerned, a properly wrapped package from either the service market or the self-service market gives his meat purchases good protection and preserves the flavor, food value, and appearance up to three days in an ordinary refrigerator and up to one year in a home freezer. However, a special type of wrapping material and wrapping method should be used for wrapping meat for home freezing.

Packaging

Packaging methods used at the wholesale level for the preservation of meats are entirely different from those used by retail markets. They are designed to preserve meats for 30 days, in some instances, and up to a year or more in other cases. The three types of packages that are generally used are tin cans, glass jars, and Cryovac. The equipment required for these types of packaging is too big and too expensive to be practical for use in retail stores.

Canned meats Cured meats such as hams and bacon and cooked meats such as lunch meats, poultry, and pork loin ribs constitute the bulk of the canned meats sold in retail markets. However, a few frozen fish items, such as oysters and clams, are canned and sold from frozen food cases. Although these products are canned, they must be kept frozen until they are used.

Two methods are used to can cured meats. In one method, the meat is cooked in the can until it is sufficiently well done to be eaten safely but not

enough to kill all the bacteria in the meat. This type of canned ham or bacon must always be kept refrigerated or bacteria will spoil the meat. The words "Keep Under Refrigeration" must be plainly printed on the outside of the can. The other method is similar, except that the meat is cooked long enough to kill all bacteria completely. This type of canned meat is referred to as "sterile" meat and needs no refrigeration. Usually only the smaller canned hams of 2 pounds or under are put up in this way. Since practically no hams of more than 2 pounds are canned by this method, the larger hams cannot be used for floor displays without refrigeration.

Glass jars The use of glass jars to preserve meat is almost unheard of today, except for fresh oysters and a few seafood specialty items such as spiced prawns, crab, and shrimp meat. These items are not sterile and, therefore, must be kept refrigerated. The life expectancy of these meats in the average meat case is about 13 days. They should be taken off sale when the code date stamped on the lid is reached. Some oysters are also sold in a container that is part can and part jar: a can on the bottom portion and a plexiglass top.

Cryovac method The Cryovac method of packaging is the latest method used in the wholesale meat business. The bag used with this method is similar to the polyethylene bag used for bagging chickens but is much heavier, stronger, and tougher. As a rule, only pickled or cured meats are packaged by this method for sale in the fresh meat cases. If the bag is not torn and the seal is unbroken, these meats will remain fresh in both appearance and flavor for at least 30 days.

In the Cryovac method, meat is placed in a bag, and a metal nozzle, which is connected to an exhaust vacuum by a hose, is thrust to the bottom of the bag. The nozzle is then worked to the top of the bag as the air is removed, and the bag is caused to form tightly to the meat. As the nozzle reaches the top, a metal clip or ring is clamped around the top of the bag, thus sealing it airtight. By removing air from the bag and preventing more from entering, the oxidation process, which is one of the major causes of discoloration and spoilage, is slowed down.

A process somewhat similar to Cryovac is now being used in packaging lunch meats and bacon. A heavy Saran-type film is used, and the air is pressed from the package before it is sealed.

Sanitary Conditions

A properly wrapped and securely sealed meat package, whether it is wrapped with paper or film, not only keeps the blood and desirable meat juices inside the package but also keeps undesirable elements such as dirt, insects, and bacteria out of the package. If a piece of meat was carried home unwrapped, it would not only result in a loss of flavor through dehydration but would also be an open invitation to contamination and spoilage from bacteria. These are the main considerations of packaging in the service markets.

The self-service market not only has the problems of the service market but also the problem of wrapping meat so that it can be handled and inspected in the display case by the customer in a sanitary manner. Health departments have not depended upon the good judgment and common sense of the market personnel to make certain that sanitary conditions are maintained. They have been instrumental in getting laws passed that protect the sanitation of the merchandise. The laws state in effect that any piece of unwrapped meat that has been touched or handled by a customer cannot be offered for sale to another customer.

The law should be kept in mind when meat is packaged for a self-service case. All meats must be completely enclosed in the film used and must be securely sealed. All torn packages must be removed from the case as soon as they are discovered, and the portion of the meat exposed by the tear must be cut away and disposed of.

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 1 – PURPOSE OF MEAT PACKAGING

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Fresh meat should be placed in the 1 2 of the refrigerator if it is not to be used within 3 days of purchase.
2. Sterile canned hams generally weigh 4 pounds or 5 .
3. Pickled or cured meats that are preserved in Cryovac bags will remain fresh in flavor and appearance for at least 6 days.
4. Fresh seafood that is preserved in glass jars has a case life of approximately 7 days.
5. Uncut smoked meats that are wrapped will remain in good condition for approximately 8 days.
6. In a self-service market, customers want 9 in size, number, and selection of cuts.
7. Three types of packages that are generally used at the wholesale level to preserve meats are 10 , 11 , and 12 .
8. Packaging methods at the wholesale level are designed to preserve meats for 13 days or for a 14 or more.
9. One big advantage a service market has over a self-service market is that the meatcutter can offer 15 service.
10. All meats sold from a display case in a self-service market must be completely enclosed in 16 and must be securely 17 .

1. _____
2. _____
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12. _____
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14. _____
15. _____
16. _____
17. _____

UNIT E — MEAT PACKAGING AND HANDLING

TOPIC 2 — PACKAGING MATERIALS

This topic, "Packaging Materials," is planned to provide answers to the following questions:

- What kinds of packaging materials are used in a service market?
- What kinds of packaging materials are used in a self-service market?
- How are the different packaging materials used by the markets?

Service Market Packaging Materials

In comparison to the large quantities of wrapping material required in the self-service markets, those used in service markets are relatively few and simple. They consist primarily of three materials: wrapping paper, waxed paper, and gummed tape.

Wrapping Paper

The wrapping paper or butcher paper used in service markets is sometimes referred to as kraft paper. Some markets use a white paper, while other markets may prefer a peach color paper. It is a wood-pulp paper that is strong, rather smooth-surfaced with a high resistance to moisture penetration. A package properly wrapped in this type of paper will keep the moisture from seeping from the meat for several hours.

Butcher paper is sold in rolls 15 and 18 inches in width and 1,300 feet in length. The wider paper is used to wrap large, bulky packages, and the narrower paper is used for smaller packages. Whenever possible, the use of the 15-inch wide paper is encouraged as an economy measure.

Waxed Paper

Although its primary purpose is not for wrapping packages, waxed paper is included in the wrapped package and is considered a part of the wrapping material. Waxed paper is a parchment-type paper impregnated with wax and cut into 10-inch squares. The squares or sheets are folded and interleaved in a pop-up type of dispenser box. The sheets either are used directly from the box or are removed and placed in a metal dispenser that is attached to or located on the meat case. This paper is used under the meat when it is placed on the scale.

Gummed Tape

Gummed tape is a paper tape that is coated on one side with a water-soluble glue. It is available in rolls approximately 1 inch wide and in almost any color. The name of the market or the company is usually printed on the top side as a means of advertising or identification. A short piece of tape is all that is needed to seal a small package. On larger packages, several short pieces will provide a better seal than one long piece.

Self-Service Market Packaging Materials

With the advent of self-service markets, the demand for new and different types of wrapping materials resulted in the development of a whole new industry. Although the wrapping materials available at first were very inadequate, the meat-wrapping supplies industry soon developed many kinds of wrapping products and is a big business today.

Film

Up until 1969 the two major types of transparent film used in markets to package meat were cellophane and pliofilm. Today these materials have been replaced by newer materials such as stretch film and shrink film.

Uncoated cellophane. Uncoated cellophane is not moisture-proof and, therefore, is not satisfactory for wrapping fresh red meats. It is used mostly for wrapping smoked and cured meats and frozen fish and poultry. In markets where both types of cellophane are used, great care must be taken to keep them separated and identified because fresh red meat wrapped in uncoated cellophane will turn dark in a matter of minutes, thus becoming practically unsalable.

Coated cellophane. Coated cellophane has a coating of nitrocellulose on one side. This side is referred to as the coated side and the other side as the uncoated or wettable side. The purpose of the coating is to make the cellophane moisture-proof and, at the same time, allow oxygen to pass through to the meat. The penetration of oxygen into the meat is what keeps the meat red. Meat wrapped in coated cellophane will stay red for about three days. Both coated and uncoated cellophane are sold in sheet form in packages of 500 or 1,000 sheets. The sheets are square and run

in 1-inch graduations from 10 to 18 inches square. The sizes used most are the 12- and 13-inch sheets. Coated cellophane is also sold in roll form for use with an automatic wrapping machine.

Pliofilm. Pliofilm is a moisture-proof, rubber-base film. Although it is transparent, it is not as clear as cellophane and does not have as much sheen.

Pliofilm comes in sheet form in the same sizes as cellophane. The most popular sizes of pliofilm are the 15- and the 18-inch size sheets, which are used mostly for wrapping large packages. Like cellophane, pliofilm also comes in roll form and was originally used only in this form. Pliofilm and cellophane are seldom used today.

Stretch film. The good features of cellophane and pliofilm were incorporated in stretch film. The combination produces the clear shiny characteristics of cellophane and the elasticity of pliofilm for form fitting to any shape package. It is used mostly for hand wrapping and comes in rolls. It can be cut with a knife, but in most cases a hot wire is used.

Shrink film. Shrink film also has the good features of cellophane and pliofilm. The item is wrapped and sent through a heated tunnel by way of a conveyor belt, which shrinks the film to the shape of the package. Shrink film is used extensively in hand operations and with automatic wrapping machines. The type of wrapping setup is usually determined by the volume of business.

Trays

To meet the packaging requirements of today, the manufacturers of four different types of trays have offered their products in more than twenty different sizes and depths. The four types are the pulp tray, the board or hard-surfaced tray, the plastic tray, which is the latest entry into the market, and the styrofoam tray, which is used the most often in markets for packaging meat.

Pulp tray. The pulp tray is made from wood pulp. It is a molded tray with a turned-out lip that gives it greater strength and rigidity. This tray is not used to any great extent today in the meat industry, but it was popular at one time.

Board tray. Board trays are also made from wood fibers. However, the fibers are pressed into a thinner, more hard-surfaced material that is similar to tag board or slick-surfaced cardboard. Instead of being molded, this material is cut and folded into shape, and the corners are overlapped and glued.

The main advantages of the board tray are its square corners, which make neater packages, flexible sidewalls, which allow a tighter wrap, and convex bottoms, which allow for a better seal. The board tray's so-called controlled absorption keeps meat juices in contact with the bottom side of the meat, thus preventing drying out, discoloration, and shrinkage. When meat is frozen in the package, it does not stick to the tray. This is an important factor because about 70 percent of the meat purchased is home-frozen from one day to three weeks before it is used.

Plastic tray. The plastic tray was introduced so that the customer could see both the bottom side and the top side of the meat product. It is made from clear plastic and is very flexible, with good corner and sidewall strength. The tray is considerably thinner than either the pulp or board tray and takes much less storage space. The bottom of the nonabsorbent tray is constructed with a corrugated or grid effect that provides depressions to contain the meat juices. The tray cannot be used to package excessively wet items such as fresh chickens or chicken parts because it does not contain the moisture inside the package. It was designed primarily for packaging red meats that have less of a moisture content. The meatcutter should use either pulp or board trays in conjunction with plastic trays so that he can wrap all meat items sold in the average retail meat market.

Plastic trays have been accepted in the markets because of stretch and shrink film, which are low heat (250° F.) sealing films.

Styrofoam tray. The styrofoam tray is essentially a plastic tray but is not transparent. Paper companies say that it is the most popular tray in the industry at the present time. It can be bought in different colors and used to decorate display cases or make attractive packages. Like the clear plastic tray, the styrofoam tray will deteriorate with too much heat.

Packaging Boards

Packaging boards are made of the same materials and by the same companies that make pulp and board trays. These flat pieces of board, which are provided in various sizes, are not used to absorb moisture or to contain the moisture in the package but rather to help give the package shape and rigidity. More important, perhaps, they afford a base on which to seal the wrapping film. Without a board between the meat and the film, the meat could be seared by the heat that is used to seal the film.

In the infancy of self-service, the packaging board was used extensively in the market. But with the advent of the wrapping machine, the popu-

larity of the board declined. Meatcutters found that trays were more adaptable for use with the wrapping device. Boards are still used, but only for hand wrapping.

Cups

Early in the development of self-service packaging, meatcutters discovered that liver could not be packaged satisfactorily with films and trays, therefore, a heavily waxed cardboard cup was used for the meat. Today, cups with certain improvements are still the fastest and most popular method of packaging liver. Many other items, such as brains, sweetbreads, chicken giblets, and the like, together with specialty items such as crab meat, shrimp, and shrimp meats, are now being sold in this type of container.

The most common types of cups in use today are a waxed paper cup and two variations of the plastic cup.

Waxed cups. The original waxed cups were heavier than those used today and had a flat cardboard lid with a small cellophane window in the center. To put the lid in place, the meatcutter had to slide it down inside the cup, where it fitted into an encircling groove about a quarter of an inch below the rim. This operation was difficult to perform. If not enough pressure was applied, the lid snapped back out. If too much pressure was applied, the lid pushed past the groove and buckled. Later, a plastic lid with a dropped rim was developed. This lid covered the entire top of the cup and snapped easily into place over the rim. The lid used today is essentially the same type of lid, except it is made of thinner paper. The cup is still of the same design.

Plastic cups. Plastic cups, which are practically the same shape as the waxed cups, come in several different colors. These cups hold up better than the paper cups and can be washed and reused by customers as refrigerator containers. The plastic cup has almost replaced the wax cup. They come in three different sizes. one-half pint, one pint, and one and one-half pints. The same lid fits all three sizes.

A new type of clear plastic cup has been introduced with a lid that is heat-sealed to the cup by a special machine. This process is more time consuming, but its use prevents the switching of lids by customers, which is not an uncommon practice. With the cups now in use, a customer can easily switch the lid from a cup of cheap pork liver to a cup of expensive calf liver. A customer can also open two cups of crab meat, completely fill one cup from the other, replace the lid, and check it out for the price originally listed on the lid. The clear plastic cup will no doubt become popular not only because of its protective features, but also because it allows the customer to inspect the contents.

Soakers

Soakers are pieces of blotter-type paper used with the tray to absorb the juices or moisture from the meat. Usually they are needed only with fish, poultry, or large beef roasts with a great deal of blood. Sometimes they are placed underneath the meat inside the package to absorb moisture directly from the meat. In other instances, they are placed underneath the tray between the bottom of the tray and the film. Here they absorb only the moisture that escapes the tray, but they still keep it inside the package. This second method has considerable merit because the soaker is still performing the task for which it was designed, but at the same time its blotter-like action is not drawing excessive amounts of juice from the meat.

Many markets do not permit the use of soakers because they feel that the customer does not understand its purpose. In these markets it is felt that rewrapping wet packages daily is more practical. In other markets it is felt that a piece of paper towel is simpler to use than the specially manufactured soaker.

Where a soaker is used, extra tare must be allowed to offset the weight of the soaker in the package. Also, extra tare must be allowed to offset the weight of the absorbed moisture. In checking a package for weight, the Bureau of Weights and Measures removes the meat from the package and weighs only the meat. This weight must equal that recorded on the label, exclusive of the film, tray, label, soaker, and moisture in the package.

Bags

Polyethylene bags were originally used in the retail market as a quick and inexpensive means of packaging whole chickens. Now, as in the case of the liver cups, other uses have been found for the bags. Sundry items, such as hog maws, pig snouts, pig ears, and beef tripe, and smoked items such as ham hocks and bacon ends, are often bagged. In some markets legs of lamb and ham cuts are bagged when on sale. While this kind of package does not look as neat as the conventional package, the packaging process is much faster and less expensive.

Polyethylene bags are usually made by companies that specialize in the making of bags rather

than the film. Three sizes are available for packaging chickens. The smallest size is used primarily for bagging frying chickens and small stewers; the next size is used for bagging large stewers and roasting chickens, and the largest size is used for bagging two or more fryers (generally done only when the chickens are on sale). A still smaller bag, made of a heavier film, is used by some markets to package liver.

Most markets prefer to use imprinted bags that carry the market or company name and, sometimes, a design to add color to the package. A few poultry growers are shipping these bags in the crates with the chickens for use by the markets. This technique is practiced only by the growers of extra-fancy poultry to establish their name in the poultry industry.

Cellophane Tape

Cellophane tape can hardly be considered a packaging material, and yet it definitely has a place in the packaging process. It is used only where other packaging methods or materials have failed. A package that has not sealed properly can be securely sealed with a short piece of cellophane tape. With this tape, small tears made in the wrapping film by sharp bones or fingernails can be repaired, or loose labels can be fastened to a package. The efficiency of a wrapper is sometimes judged by the amount of cellophane tape he uses. In any case, no market should operate without an adequate supply of it on hand. Although the tape is fairly expensive, the savings, both in time and materials, far offset its cost.

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 2 – PACKAGING MATERIALS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Because it is not moisture-proof, 1 2 should not be used to wrap fresh 3 meat.
2. The wrapping paper or butcher paper used in service markets is sometimes referred to as 4 paper.
3. Shrink film is used extensively in 5 operations and with 6 wrapping machines.
4. Pieces of blotter-type paper that are used with trays to absorb the juices or moisture from meat are called 7 .
5. Chicken is packaged almost exclusively in 8 9 .
6. Butcher paper is made in roll widths of 10 and 11 inches and a standard length of 12 feet.
7. The plastic tray was introduced so that the customer can see both the 13 side and 14 side of the meat.
8. Stretch film combines the 15 characteristics of cellophane and the 16 of pliofilm.
9. According to paper companies, the 17 tray is used the most in markets for packaging meat.
10. The primary purpose of waxed paper is to keep the 18 clean.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 3 – PACKAGE LABELING

This topic, "Package Labeling," is planned to provide answers to the following questions:

- What is the status of standardized labeling?
- What governmental agencies are responsible for enforcing labeling regulations?
- What labeling regulations are applicable to the meatcutting trade?

Meat labeling is currently undergoing a complete change from sectional labeling to a standard type of national labeling. At the present time it is a voluntary plan, but it will probably be compulsory in the near future. The standardized names apply mainly to the retail meat trade but will eventually be used in all areas of the meat industry.

Labeling Practices

Service markets do not label their meat because the customer may have his questions answered by the meatcutter before he makes a purchase. Also, the customer is told the weight and price of his purchase before it is wrapped by the meatcutter.

Labeling is a detailed operation in the self-service market (Fig. E-1). In most instances the meat is packaged and label is affixed. A few markets, however, weigh the meat before it is packaged and place the label inside the package to prevent label switching by the customer.

Packages should be labeled uniformly. Packages that are labeled in the corner will make a neater looking display in the meat case. Labels should never be placed where they conceal fat, bone, or discolored pieces of meat. If this practice is permitted, the customer may distrust the market.

Fig. E-1. Using a labeling machine

Labeling Problems

One of the biggest problems of early self-service marketing was getting the labels to stay on packages. Poor glue was the major cause of this problem. After it was melted by heat, the glue became too hard when placed in a cold meat case and, consequently, the label dropped off the package.

Today's labels are made of thinner paper. The glue is more quickly activated by heat and remains soft and slightly sticky after being placed on the package. Usually, if they are affixed correctly, these labels will tear before they can be pulled off. However, even today's labels will not stick if they are placed on a package with film wet from condensation. After the glue is heated, the label should be placed on the package quickly before the glue cools and pressed firmly so that all parts of the label contact the wrapping film. Label switching is almost impossible if the labels have been fastened firmly.

Enforcement of Labeling Laws

The agencies in charge of enforcing the present labeling laws have been active in issuing citations for false and misleading labels because of the growing number of complaints. In Los Angeles County the Health Department requires that all meat package labels conform with certain labeling regulations similar to, but not totally in accord with, the new Meat Board recommendations. Markets within the county's jurisdiction have been required to show species and primal cut designations on their labels since the beginning of 1973. Although there is no law covering this requirement, uncooperative merchants could be charged with mislabeling practices under the Sherman Food,

Drug, and Cosmetic Act of 1971. This is an example of how regulations are interpreted and enforced. The regulations may vary from county to county; therefore, it is essential that meatcutters be familiar with the interpretation in their area.

Pure Food and Drug Administration

The Pure Food and Drug Administration is responsible for enforcing laws covering ingredients and ingredient labels. For example, the agency not only checks the fat content of sausage (50 percent) and of beef (30 percent), but also checks for foreign or harmful ingredients in products (Fig. E-2). If a product is labeled beef, it cannot contain any lamb or pork, which would be considered foreign ingredients or ingredients that are not listed.

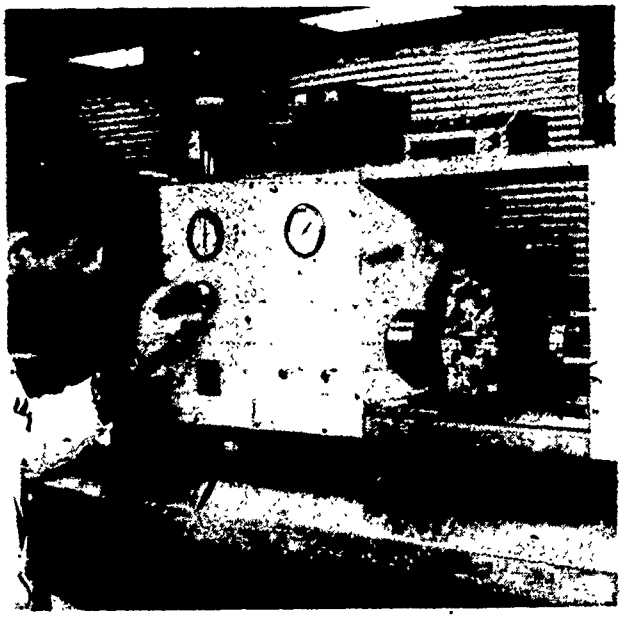

Fig. E-2. Measuring fat content

Division of Measurement Standards

The Division of Measurement Standards of the California State Department of Food and Agriculture is responsible for enforcing the laws that cover products sold by weight or measurement, which includes a large area outside the food industry. The Division requires only that the correct weight and total price be marked on the label. However, labels in markets that use automatic scales have much more information printed on them. The labels from an automatic scale generally contain the following data:

- Weight–If the scale weighs in pounds and ounces, the weight should be correct to the nearest quarter ounce. If the scale weighs in pounds and hundredths of pounds, the weight should be correct to the nearest hundredth of a pound.
- Price per pound
- Total price
- Grade of meat
- Code date–Tells when the package of meat should be removed from display if not sold.
- Cut identification–Provides the name of the cut, kind of meat (pork, beef, or veal), and ingredient content if it is a mixture.
- Wrapper identification–Used to track down mistakes.
- Company identification–A form of advertising.

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 3 – PACKAGE LABELING

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Package labeling is experiencing a complete change from __1__ labeling to a standard type of __2__ labeling. 1._____ 2._____

2. The Division of Measurement Standards is responsible for enforcing regulations that cover products sold by __3__ or __4__. 3._____ 4._____

3. If the scale weighs in pounds and ounces, the weight given on the label of a piece of meat must be correct to the nearest __5__ of an ounce. 5._____

4. Packages that are labeled in the __6__ usually make a neater looking __7__ in the meat case. 6._____ 7._____

5. Labels should never be placed on a package where they conceal __8__, __9__, or __10__ pieces of meat. 8._____ 9._____ 10._____

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 4 – METHODS OF WRAPPING IN SERVICE MARKETS

This topic, "Methods of Wrapping in Service Markets," is planned to provide answers to the following questions:

- **Why is packaging important in a service market?**
- **What are the different wrapping methods used in service markets?**
- **When are the different wrapping techniques used?**

Wrapping meats in a service market is a relatively simple procedure that is easy to learn. Nevertheless, customers often leave the service market with sloppily wrapped packages. The meatcutter should remember that a neat, compact, nonleaking meat package is as much the mark of a good meatcutter as a correctly cut piece of meat.

Waxed paper is important in maintaining cleanliness and sanitation in the service market package. A piece of meat that is taken from display for viewing by the customer should be placed on waxed paper. The use of this paper gives a much better impression and is more sanitary than holding the meat in the bare hand. The paper is left under the meat as it is being weighed to keep the scale clean and is then wrapped in the package with the meat.

With ground meat, a piece of waxed paper is placed over as well as under the meat to prevent the meat from sticking to the outer wrapper of butcher paper. Also, when handling and wrapping very bloody meats, such as liver, an inner wrap of waxed paper will help in containing the juices within the finished package.

Wrapping Techniques

Two wrapping techniques are used in service markets. triangle wrap and drugstore wrap. The use of these wrapping techniques depends on whether the customer wishes to use the meat within a few days or intends to freeze it for future use.

Triangle Wrap

The triangle wrap, or butcher wrap, is used most often in the service market. Although it is not as satisfactory for freezer use as the drugstore wrap, the triangle wrap does provide fairly good protection for meat over short periods of time.

In wrapping small pieces of meat, the following procedure should be used:

1. Tear the paper from the roll of butcher paper and lay it on the wrapping shelf along the back of the meat case or on top of the case. For small packages, paper should be used from the 15-inch roll; the length should not be much greater than the width.
2. Lay the meat with its inner wrap of waxed paper diagonally on the paper at the nearest corner and fold the corner over the meat.
3. Fold the corners from either side firmly into place over the first corner and hold them in place as the meat is rolled toward the remaining corner.
4. Hold the wrap in place and tape it securely with a short piece of gummed tape.

If this procedure is followed correctly, it will produce a tight, compact package that is neat in appearance and able to withstand rough handling without tearing or breaking.

For wrapping a large piece of meat, such as a roast or ham, this technique is varied slightly. The paper used is generally from the 18-inch roll. The length of the paper is usually about twice that of the width, depending, of course, on the size of the meat to be wrapped.

Wrapping several small pieces of meat into one large package is more economical in terms of labor and material costs than wrapping them into several small packages. In these cases, the meatcutter starts out using the same technique described for wrapping a small package. After the nearest corner has been folded over the meat, the corner on the right is folded in (in the case of a left-handed wrapper it would be the left corner). Next, the meat is rolled toward the farthest corner of the paper. After one or two complete turns, or when the top of the meat is covered by the paper, the left corner or left side is folded in. The package is rolled until the remaining corner is reached and then sealed with gummed tape.

A double wrap is often used for added protection, where juice is apt to leak or bones tear the

paper, or where the meat is to be frozen. It is better to use two short pieces of paper and make a double wrap than to use an extra long piece for a single wrap. The double wrap is made in the same manner as the single wrap, except the package is not sealed with tape at the end of the first wrap. The final wrap is sealed in the same manner as the single wrap. When a double wrap is used, the ends as well as the sides of the package are protected by extra layers of paper. This is not done when an extra long sheet and a single wrap are used.

The secret of successful packaging is in selecting the right size paper and in keeping the package tight as it is being rolled. The use of too much paper not only is wasteful but also makes a bulky package that is hard to seal. The use of too little paper does not give adequate protection.

Drugstore Wrap

The drugstore wrap is used only when meat is to be frozen for a period longer than two weeks (Fig. E-3). A special freezer wrap paper is also used when wrapping for longer periods of freezing.

In making the drugstore wrap, the following procedure should be used:

1. Place the meat in the center of the sheet of wrapping material with the sides and ends parallel with those of the paper.
2. Bring the ends of the paper together at the point where they meet above the meat.
3. Fold the ends together in a fold approximately 1 inch wide all the way across the paper.
4. Make a series of folds of the same width until the meat is reached. This procedure will result in a fold approximately 1 inch wide running all the way across the top center portion of the package.
5. Press the sides around and firmly against the sides of the package. A triangular-shaped portion of the paper will extend past the sides on both the top and bottom.
6. Fold the bottom section up against the side of the package and fold the top down with its creased folds over the side and underneath the package.
7. Tape the folds in place.

If the package is correctly wrapped and a good freezer wrap paper is used, the package will be virtually airtight. The meat will be protected from freezer burn and oxidation in freezer storage for periods of up to one year.

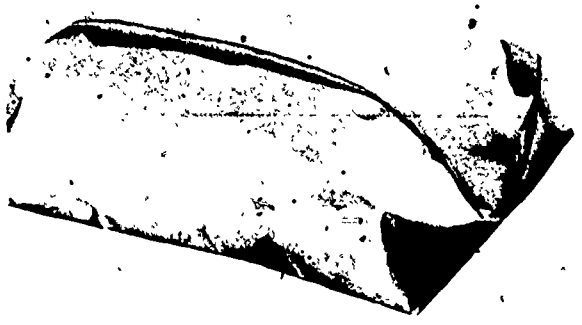

Fig. E-3. Drugstore wrap

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 4 – METHODS OF WRAPPING IN SERVICE MARKETS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. To provide better protection for meat, the meatcutter should use _1_ _2_ pieces of a double wrap. 1._____ 2._____

2. For wrapping ground meat, a piece of _3_ paper should be placed _4_ as well as _5_ the meat. 3._____ 4._____ 5._____

3. The triangle wrap is also known as the _6_ wrap. 6._____

4. Small packages should be wrapped with paper from _7_ - _8_ size roll. 7._____ 8._____

5. The main purpose of waxed paper is to help maintain _9_ and _10_. 9._____ 10._____

6. The _11_ wrap is preferred for packaging meat that is to be frozen for a long period of time. 11._____

7. While frozen, meat must be protected from oxidation and _12_ _13_. 12._____ 13._____

8. The length of the triangle wrap should not be much greater than the _14_. 14._____

9. In making the drugstore wrap, the meat is placed in the _15_ of the sheet of wrapping material. 15._____

10. The secret of successful packaging is in selecting the right _16_ paper and in keeping the package _17_ as it is being rolled. 16._____ 17._____

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 5 – METHODS OF WRAPPING IN SELF-SERVICE MARKETS

This topic, "Methods of Wrapping in Self-Service Markets," is planned to provide answers to the following questions:

- What wrapping methods are used in self-service markets?
- What are the two types of wrapping machines?
- Why is choosing the right size paper for wrapping important?

In the service market, packaging equipment consists of nothing more than a rack for holding the wrapping paper and a dispenser for the gummed tape. But in the more complex world of the self-service market, the meatcutter has need of many pieces of expensive wrapping equipment.

Wrapping Methods

Two methods of wrapping are used in self-service markets—hand wrapping and machine wrapping. At first only hand wrapping was used for all meat items, including sliced bacon and luncheon meats. However, wrapping machines have now taken over many of the jobs formerly performed by human wrappers. The ratio of wrappers to meatcutters has dropped accordingly. For example, a market that does all of its wrapping by hand usually employs one wrapper to every two meatcutters. This ratio is more like one wrapper to four meatcutters in shops that use wrapping machines. And in shops that use the latest wrapping machines and automatic scales, it is possible for two wrappers to wrap all of the meat cut by 10 meat cutters.

The hand wrapper's job, however, appears to be secure for sometime to come because a machine has not yet been developed that will successfully duplicate all the expert hand operations necessary in wrapping such items as leg of lamb, half pork loins, and extra large roasts. Also, many markets, especially those with a sales volume less than $5,000 a week, still feel that hand wrapping is more economical than investing in expensive wrapping machines.

Packaging Meats

The process of packaging meats begins in the cutting room when the meatcutter performs the initial step of placing meat in the tray. In selecting the correct tray, the meatcutter should keep the following points in mind:

1. The meat should, as nearly as possible, cover the bottom of the tray.
2. Flat cuts of meat such as steaks or chops should always be put in low sidewall trays.
3. High sidewall trays should be used for thick roasts or for packages containing many pieces of meat, such as stew meat or oxtails, that might fall from a low-sidewall tray before reaching the wrapper.
4. Sharp protrusions of bone that could tear the wrapping film should be rounded off or covered.
5. All meat should fit inside the limits of the tray walls, particularly if a wrapping machine is being used, because a tray with contents that overlap the sidewalls either will cause a poor wrap and seal or will not go through the wrapping machine.

Different tray sizes must be used sometimes to package all of the same type of meat cuts. In this case, the variation in size should be in the width of the tray rather than in the length of the tray. For example, a No. 1½ tray, or its equivalent, is most often used for packaging stew meats, while a No. 2 tray is used for the larger packages of stew. These two trays are of the same length, but the No. 2 tray is approximately twice as wide. Because the packages are of the same length, they can be displayed in the same row in the meat case, thus giving the display a neat appearance.

Hand Wrapping

Two methods of hand wrapping are used, both of which are performed in almost all self-service markets. The first method involves using a hand iron for sealing packages, and the second method involves using a hot plate. In addition, some meats lend themselves to packaging in bags. Special techniques have been developed for these wrapping methods.

Hand Irons

At first only hand irons were used to seal packages, but they are used in very few operations

today. The hand iron is a lightweight movable heating device resembling a soldering iron. It is powered by electricity and includes its own thermostatic control.

In the hand iron method of wrapping, the meat is placed diagonally and upside down on the wrapping film. The nearest corner of the film is folded over the meat or meat tray. Next, the right corner—if the meatcutter is right-handed—is folded over this corner, and the farthest corner is folded over both. At this point the hot hand iron is passed firmly over the package, sealing together all three corners. Then, the package is rotated a quarter turn, placing the remaining corner on the side farthest from the handwrapper. This corner is pulled tightly over the package and sealed in place on top of the three sealed corners. Finally, the package is turned upright and sent to the scale for labeling. Experienced wrappers sometimes fold all four corners into place before sealing, but unless they are skilled in this sealing operation, the time saved will be somewhat offset by the resulting loose package.

Only pieces of meat that are not placed in a tray before wrapping are wrapped by the hand method today. These meat items, such as leg of lamb, do not form a package with definite ends and sides as does a meat tray. When such items are wrapped, they are turned upside down and placed diagonally on the film. The opposite corners of the film are pulled across the length of the meat and sealed into place. Loose or open corners are often formed where the sides of the film meet because of the irregular shape of the package. The application of heat to any loose spot in the film will cause it to shrink and form to the contour of the meat.

Stretch film is used most often in packaging large or irregular cuts because it stretches and conforms more easily to the shape of the meat being wrapped.

Hot Plates

The hot plate method of packaging is used today for wrapping meat with or without trays. The hot plate measures about 6 by 8 inches and is placed at table-top level in the wrapping station. The thermostat on the hot plate is usually set at about 300° F. for use with stretch film, which is used most often with this sealing device. A protective sheet of peach paper should be placed under irregular roasts and cuts to protect them from discoloration. Peach paper is a specially treated paper that is used for separating cut surfaces of fresh meat while it is in storage and is never part of the wrapping materials.

The initial steps in the hot plate method of wrapping are the same as those for the hand iron method. The film is laid on the wrapping table, the tray of meat is turned upside down, and the meat is placed diagonally in the center of the film. The first three corners are folded into place in the manner previously described for wrapping with a hand iron. These corners are held firmly in place, and the package is turned upright and slid across the hot plate, thus sealing the corners together. The package is turned upside down again and the remaining corner is pulled tightly over the end and across the bottom of the package. The package is then turned right side up and slid across the hot plate for the final seal.

One variation of this wrapping procedure is to lift the package off the hot plate after the first seal and pull the remaining corner down and underneath the package. The package is then set back on the plate for the final seal. This operation saves turning the package over twice but may result in a poor seal. Also, all four corners can be turned in and sealed at the same time. The meatcutter must have considerable wrapping experience because this operation is more difficult to perform with a hot plate than it is with a hand iron.

Bags

When bags for chickens first came into use, many markets used funnels that were attached to cutting blocks or tables to put the chickens into the bags. A tape dispenser was used with the funnel, and a piece of tape was used to close the bag.

Today, very few funnels and tape machines, if any, are used to bag chickens. Most markets bag chickens by hand and close the bag with a short piece of paper-covered wire similar to that used in the produce department to tie lettuce or stalks of celery. The stapling machine is also a popular method for closing bags. This method is just as fast as using the paper-covered wire, looks neater, and holds the bags closed more securely.

A few markets also use liver bags that must be hand-sealed with a special machine. The machine has a hopper that resembles the hopper of a small meat grinder. Sliced liver is placed on the hopper, a bag is slipped up over the funnel-like spout, and liver is dropped through the spout into the bag. The top of the bag is then stretched flat and placed on a sealing plate. By the application of pressure on a foot pedal, the sealing arm is brought down to

seal the package. Liver blood must not be allowed to get on the inside surfaces of the top of the bag or the bag will not seal properly. Although liver bags are much less expensive than liver cups, they are not widely used because it takes longer than packaging in cups and requires a machine.

Machine Wrapping

Two types of wrapping machines are used in the larger meat markets—the semiautomatic wrapping machine, which produces the triangle wrap, and the automatic wrapping machine, which produces a wrap similar to the drugstore wrap.

Semiautomatic Wrapping Machines

The semiautomatic wrapping machine depends on the hand wrapper to make the first seal. Although the triangle wrap is used, the initial steps are slightly different from those in straight hand wrapping. The first seal is performed on a specially built wrapping station just back of the machine wrapper. The meat is placed right side up above the sheet of cellophane and over the corner closest to the machine. The opposite corner of the film is pulled tightly over the meat. Then, the package is lifted, and the fold is completed by bringing the corner under it. The seal is completed by sliding the package over a hot plate and then onto the machine, which performs the remainder of the wrapping and the final seal. From this point, the package is usually carried to a dump bin from which a wrapper takes it to the weighing equipment.

The conveyor chain that carries the package through the wrapping machine is usually synchronized with the automatic labeler. This equipment carries the package across the scale and automatically affixes the printed label to the package and then carries it to the lazy Susan or dump bin.

Points that should be considered before a semiautomatic wrapping machine is purchased are as follows:

1. These machines are used only with stretch film and, because the first seal is done manually, they require sheet stretch film rather than the roll type used with automatic equipment.
2. The operator must reset the mechanism each time packages of different lengths are processed.
3. When the automatic labeler and scale are connected to the wrapping machine, the operator must also place the commodity inserts in the scale and make the appropriate adjustments for price and tare.

Semiautomatic wrapping machines are built by a number of manufacturers. All of the machines can be connected to any of the automatic labelers and scales.

Automatic Wrapping Machines

Unlike the semiautomatic machine that produces the triangle wrap, the automatic machine wraps in a style similar to the drugstore wrap. The automatic machine uses stretch, shrink, or Cryovac roll film in widths ranging from 10 to 18 inches. It requires an attendant, who must place meat in position for wrapping (Fig. E-4).

The first of the automatic machines to be introduced wraps only with cellophane. Once the meat is placed in position on the machine, it completes all wrapping and sealing operations. The machine has been adapted for use with an automatic labeler and scale.

With this machine, the actual wrapping can be done faster than on a semiautomatic machine. But, because all wrapping is done by the machine, more adjustments must be made before starting wrapping operations. The final package is not as neat as that obtained from the semiautomatic machine or from hand wrappers. In addition to being reset for the different package lengths, the machine must also be reset for proper width, and tension on the

Fig. E-4. Automatic wrapping machine, scale, and labeler

roll must be varied for different widths, lengths, and quantities.

Another automatic machine has been designed for wrapping with the experimental shrink-type films. This machine can use plastic trays as well as board and pulp trays because it uses a lower sealing temperature. However, just as with the other automatic machine, an adjustment must be made for different package lengths, but none is necessary for cutting film to length or for adjusting tension on the roll.

To ensure a neater package, a conveyor carries each wrapped package through a "shrink tunnel," where warm air is applied. The warm air tends to shrink the film to conform to the contours of the meat.

This machine can be connected with an automatic labeler and scale in the same manner as the semiautomatic machine. The attendant must place the proper commodity inserts in the scale and make the appropriate adjustments for price and tare. In cases where these machines are included in the automatic flow pattern, they are placed between the lazy Susan and the shrink tunnel.

Points to Remember

Many factors other than the mechanical skill needed to place a sheet of film around a piece of meat enter into making a successful wrapping operation in a self-service market.

The meatcutter should always place the wettable side of coated cellophane next to the meat to prevent discoloration that may cause a loss in profits. Many persons mistakenly think that the coated side of the cellophane should be applied to the meat. However, just the opposite is true. The coated side of cellophane can be found by turning back one corner and rubbing it on the surface of the sheet. If it slides easily, it is the coated side. If it feels slightly sticky and does not slide easily, it is the uncoated side. Another method is to taste the cellophane, as the uncoated side has a sweet taste. While this method is still practiced, it should never be used for sanitary reasons. The top sheet only in each box need be tested because the material is packaged in a uniform manner.

Choosing the right size sheet of wrapping material is even more important in the self-service than in service market. The cost of film wrap is much greater than the cost of paper. The use of too much film will make the package difficult to seal; the film will be loose, and much of the eye appeal of the package will be lost. If too little film is used, the corners will not overlap enough to seal, and the package will have to be rewrapped, thus wasting both film and labor.

In a service market, selecting the right size sheet of film is a more difficult task than choosing the right paper because two widths are normally used in 3-inch graduations. In self-service markets, nine or ten choices in 1-inch graduations are available. The wrapper who uses good judgment in selecting film sizes is a big asset to the market.

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 5 – METHODS OF WRAPPING IN SELF-SERVICE MARKETS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Where all wrapping is done manually, the proportion of wrappers to meatcutters is usually 1 to 2. 1. _____ 2. _____

2. The variation in size of trays used because of the differences in sizes of like cuts of meat should be in the 3 of the trays rather than in the 4 of the trays. 3. _____ 4. _____

3. For the hard-to-wrap cuts of meat, the package is sealed with a 5 6. 5. _____ 6. _____

4. The meatcutter should always place the 7 side of coated cellophane next to meat. 7. _____

5. The semiautomatic wrapping machine produces a 8 wrap, while the automatic wrapping machine produces a wrap similar to the 9 wrap. 8. _____ 9. _____

6. Semiautomatic wrapping machines use only sheets of 10. 10. _____

7. Automatic wrapping machines use only film supplied in 11 form. 11. _____

8. When an automatic wrapping machine and shrink tunnel are used with an automatic labeler, the labeler is placed 12 to the shrink label. 12. _____

9. If a pliofilm wrapped package is to be sealed on a hot plate set at 300° F., a protective sheet of 13 14 should be placed under irregular roasts and cuts prior to sealing. 13. _____ 14. _____

10. Before packages are placed on an automatic scale, the operator must put the proper commodity insert in the scale and make the appropriate adjustments for 15 and 16. 15. _____ 16. _____

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 6 – PREPARATION OF MEAT FOR THE HOME FREEZER

This topic, "Preparation of Meat for the Home Freezer," is planned to provide answers to the following questions:

- What are the three natural processes that meat is subject to in the freezer?
- How should meat be wrapped for home freezer storage?
- What factors should be taken into consideration when meat is processed for the home freezer?
- What are some of the most common questions asked about freezing meat?

In the past, the art of preserving meats in the home was limited to three methods: drying, curing or pickling, and canning. However, the introduction of the deep freezer into the home now offers a fourth and generally more satisfactory method. Freezing is an easy and relatively simple method for preserving meat for a reasonable length of time.

The ready acceptance of frozen meats by the consumer has opened a new avenue for sales by the meatcutter. The amount of sales usually depends on how well the meatcutter understands processing, handling, wrapping, and storing frozen meats. Sales might also depend to some degree on how well he educates his customers in the proper ways to freeze meat.

Natural Meat Processes

Meat in a freezer is subject to three natural processes: spoilage, dehydration, and oxidation. Because of these processes, it is important that meat be selected, prepared, and wrapped very carefully.

Spoilage

Meat that is sold to the customer for freezing should always be as fresh as possible because bacterial growth has already started in the meat. Bacteria growth will continue until the temperature of the meat is lowered to 20° F. and, in some cases, some growth may continue until the meat has reached a temperature as low as 5° F. The average home freezer is not designed for quick freezing but only as a storage box for prefrozen food. After fresh meat has been placed in the home freezer, considerable time is required before the internal temperature of the meat reaches a temperature that will stop the growth of bacteria.

Dehydration

Air should be kept away from frozen meats because it causes dehydration or freezer burn, which is the loss of moisture through evaporation. This condition is objectionable because it gives meat an unappetizing appearance and leaves it dry and tasteless.

Dehydration is caused by the same cold temperatures that protect the product. The ability of air to retain or hold moisture changes as the temperature of air changes. Warm air holds more moisture than cold air. As the air become warmer, it exerts a pull on the moisture in the package that changes the moisture into a vapor. As the air cools again, the air is not able to hold the moisture, which is released in the form of frost crystals. This process is repeated each time the freezer door is opened. Warm air can be prevented from entering the package by the use of good wrapping materials and proper wrapping methods.

Oxidation

Another reason for striving to obtain an airtight package is oxidation, which occurs whenever oxygen comes into contact with meats, whether they are fresh or frozen. Fat meat tissues oxidize more rapidly than lean tissues, but all meat tissues are affected by the process of oxidation. Oxidation cannot be detected visually like dehydration because it has little effect on the appearance of the meat. Oxidation produces a flat, rancid, and unpleasant taste and is as much of a freezing hazard as dehydration. Therefore, oxygen must not be allowed to pass through the freezer paper barrier in any appreciable amount over a very long period of time.

Processing Meats for Freezers

In processing meats for home freezers, the following factors must be taken into consideration:

1. The storage space in the average home freezer is somewhat limited. If the bones are removed from the meat, it will not

only make a smaller package but will also reduce the chances of the wrapping material from becoming torn. Furthermore, a small package will freeze more quickly than a large package. Meat that is frozen fast is usually in the best condition when it is taken out of the freezer to be cooked.

2. The fats in meat will oxidize much more rapidly than the lean portions of the meat. Fat may become rancid, while the lean is still eatable. This condition is especially true of pork that has unsaturated fat. Therefore, as much fat as possible should be removed from the meats. Although fats contribute greatly to the flavor of meats, most of this flavor comes from the marbling–fats intermingled throughout the lean–rather than from the outside cover of fat.
3. Frozen meats are better when cooked while they are still frozen. The pieces of meat in a package should be separated by interleaving waxed or parchment paper so that they can be separated for cooking. Otherwise, the customer will have to wait for the entire mass to thaw before he can start to cook.
4. The size of the piece of meat and the number of pieces in the package should conform as nearly as possible to the customer's requirements for one meal. Compliance with these guidelines precludes the possibility of spoilage caused by unwrapping and improper rewrapping and partial thawing and refreezing of the meat.

Wrapping Meat for Freezers

The purpose of the drugstore wrap is to exclude outside air from the package. This goal cannot be achieved unless the correct wrapping materials are used. The use of kraft or butcher paper is not recommended for making the drugstore wrap because this paper is not vaporproof.

The first type of freezer wrap used was a wax-coated kraft paper. It is still in use today and is one of the most inexpensive freezer wrap materials. One of its disadvantages is that it tears rather easily with rough handling. Aluminum foil and wrapping films are vaporproof, but they also tend to tear rather easily, especially when they become brittle from the freezing temperatures. The heavier films such as Cryovac are much tougher and are not affected by freezing temperatures. Almost all frozen poultry and some frozen fish items are wrapped in Cryovac at the wholesale level.

During the search for better freezer wrapping material, some companies began laminating two pieces of kraft paper with a vaporproof laminate. The double thickness of paper provides additional strength, and the laminate excludes air. Another approach is a high-grade kraft paper with a polyethylene coating that is vaporproof and adds both strength and pliability to the paper. The same manufacturer has also developed still another freezer wrap that has a strong outer layer of kraft paper joined to an inner kraft sheet by a moisture proof laminating material. A protective plastic coating is provided over this three-ply combination.

The special freezer wraps described are, of course, more expensive than ordinary waxed paper. But the cost of losing meat because of improper wrapping should be compared to the extra cost of the special paper. Also, customer satisfaction depends more on the condition of the meat at the time he uses it than on the condition of the meat when he purchases it at the market.

Customer Education

The average customer is unaware of the many hazards involved in the freezing and storing of meats. Any effort the meatcutter can make to inform the customer will help in creating long-term customer satisfaction and future sales. Some of the most frequent questions are as follows.

1. *How long can I keep frozen meat in my own freezer?* Beef may be kept for 4 months at 10° F., 6 months at 0° F., and 12 months at −10° F. Table E-1 gives recommended keeping times for most meats.

TABLE E-1

Recommended Maximum Keeping Times For Meat Preserved In Home Freezers

Kind of meat	Months	Kind of meat	Months
Beef	10 to 12	Poultry,	6 to 8
Veal	10 to 12	Fatty Fish	3
Lamb	10 to 12	Lean Fish	6
Pork	4 to 6	Sea Food	6 to 8
Ground Beef	6 to 8	Sausage	1 to 3
Whole Ham	4 to 6	Cut Ham	1 to 2

2. *What is the best method for freezing large quantities of meat?* The home freezer is not

designed for quick freezing large amounts of meat. The coldest spots in it are around the walls; therefore, small quantities of packaged meat should be placed around the walls and then moved to the center of the box when they are completely frozen. This process should be repeated until all of the meat packages are frozen. When a large amount of unfrozen meat is placed in a freezer, it not only prolongs the freezing period, but it also raises the temperature of the box to a point where the already frozen meats and other items will partially thaw.

3. *May I safely refreeze meat that I have thawed?* This question is asked quite often and is difficult to answer. It is possible to refreeze thawed meat without it becoming spoiled if: (1) the meat was fresh when it was first frozen; (2) the thawing out process was fast; (3) the time spent in a thawed state was short; and (4) the refreezing time was fast. As a rule, the average homemaker cannot be sure of any of these conditions.

Some bacteria that lay dormant at temperatures below 20° F. will begin to grow again when the temperature is raised to 20° F. and will grow more rapidly with any increase in temperature. This process sometimes causes meat to spoil, especially if it was not fresh when it was frozen.

Even if meat does not spoil, it will lose the juices that contribute to its flavor, food value, and appetizing appearance. Tiny ice crystals form in the muscle tissue when it is frozen too quickly. During slow freezing, large ice crystals form, causing some cell tissues to rupture and some connective tissues to expand. When this meat is thawed, the ruptured cell tissues and expanded connective tissues allow juices to escape from the meat. This process is repeated each time the meat is thawed and refrozen until it is spoiled, or it becomes a dry, tasteless, fibrous mass.

4. *Can I safely keep frozen meat for long periods in the freezer compartment of my refrigerator?* Customers should not be encouraged to keep meat frozen for long periods of time in the freezer compartment of their refrigerators, or should they be encouraged to refreeze it. Even if meat is properly prepared and correctly wrapped, it will still continue to deteriorate under the most ideal freezer conditions. The freezer compartment of the home refrigerator *does not* offer ideal freezer conditions.

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 6. – PREPARATION OF MEAT FOR THE HOME FREEZER

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The 1 tissues in meat will oxidize more rapidly than the 2 tissues in meat. — 1. _____ 2. _____

2. Frozen meats should be cooked 3 thawing. — 3. _____

3. Bacterial growth will continue in meat until the temperature is lowered to about 4. — 4. _____

4. The first requirement of a paper that is to be used for wrapping meat for freezing is that it be 5 proof. — 5. _____

5. Air should be kept from frozen meats to protect them from 6 and 7 8. — 6. _____ 7. _____ 8. _____

6. Under ideal conditions, pork can be kept frozen for a maximum of 9 months, and sausage may be kept frozen for a maximum of 10 months. — 9. _____ 10. _____

7. Freezer burn is the loss of 11 through 12. — 11. _____ 12. _____

8. When meat is frozen slowly, 13 ice crystals form, causing cell tissues to 14 and connective tissues to 15. — 13. _____ 14. _____ 15. _____

9. The freezer compartment of the home refrigerator 16 17 offer ideal freezer conditions. — 16. _____ 17. _____

10. Oxidation produces a 18, 19, and 20 taste in meat. — 18. _____ 19. _____ 20. _____

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 7 – HANDLING FROZEN MEATS

This topic, "Handling Frozen Meats," is designed to provide answers to the following questions:

- What is the best temperature for transporting and storing frozen meats?
- How important is the storage life of frozen meats?
- What is the difference in cutting fresh and frozen primal cuts?
- Why should frozen meat be repackaged daily?

Large quantities of frozen meats of various types are being introduced into retail meat markets today. In most cases, these meats are packaged and processed at the wholesale level, and no further packaging or processing, other than pricing, is necessary at the retail level. The two exceptions are bulk-packaged frozen fish, which is thawed, processed, and sold from the fresh meat section of the market, and frozen bull meat used to "lean up" beef trimmings for ground beef. In addition, a small number of frozen primal cuts of beef and pork and whole carcasses of lamb are processed and sold from the fresh meat section to supplement the fresh supply.

The three basic factors involved in the handling of frozen meat are temperature control, processing, and packaging.

Temperature Control of Frozen Meat

Temperature control is just as important for frozen meats as it is for fresh meats. However, it is much more difficult to maintain for frozen meats because the temperature must be kept at 0° F. or less. For delivery of frozen meats, only refrigerated trucks capable of maintaining a refrigeration temperature of 0° F. or less should be used. Frozen meats should be transferred immediately from the truck into the frozen food walk-in box at the retail market. In stocking frozen meat display cases, the frozen meat should not be stacked above the freeze line.

Frozen fish or poultry, if allowed to thaw partially before storage, is likely to be squeezed out of shape when it is stacked in the walk-in freezer. Frozen meats such as steaks and veal cutlets usually become discolored when they are thawed and refrozen and are almost impossible to sell. Because of the long storage life and case life of commercially processed and packaged frozen fish and meats, many meatcutters think that it is not necessary to rotate these products. However, this is a misconception. Although fish and meats are frozen solid, the processes of oxidation and dehydration will cause them to deteriorate. The longer they are kept in frozen storage, the less likely they are to resemble their original fresh state when they are cooked.

These products should be sold on a first in, first out basis in the same way that fresh meats are sold. The packaging date is often stamped on the bottom of the consumer package as an aid for proper rotation. A package that remains on display in a freezer case soon becomes shopworn and loses some of its appeal, which is reason enough for maintaining a good rotation system.

Different types of fish, like certain red meats, have a longer frozen storage life than other kinds of fish. Some fish contain more fat than others, and fats oxidize more rapidly than lean tissues. Table E-2 gives the approximate frozen storage life of different varieties of fish under ideal freezer conditions.

TABLE E-2

Storage Life of Frozen Fish

Kind of fish	Months
Lean fish fillets	10 to 12
Whole lean fish	8 to 10
Fat fish fillets	8 to 10
Shrimp (breaded)	9 to 10
Precooked seafoods	6 to 7
Halibut (steak)	5 to 6
Salmon (steak)	3 to 4

Processing Frozen Meat

In markets equipped with power saws, cutting retail cuts from frozen beef and pork primals does not differ greatly from cutting fresh primals. However, the frozen primals must be pushed through the saw more slowly, and final trimming with a knife is more difficult because of the hardness of the fat. Otherwise, the only difference

in working with frozen and fresh meat is in the removal of bone dust from the cut surfaces of frozen meat. This dust freezes immediately to the cut surfaces and cannot be wiped off. It must be scraped off by the meatcutter.

Before fresh lamb is sawed, the fell is removed from the rib, small loin, and sirloin chops, and the chops are knifed. The frozen lamb chops are sawed without knifing, and the fell is then trimmed from each chop. The remaining parts of the frozen lamb are cut in the same way as fresh lamb.

In markets not having power saws, frozen meats must be at least partially thawed and then cut in the conventional manner. However, thawing frozen meat before cutting shortens its case life.

Cutting frozen meats as close to the time of sale as possible must be a prime consideration, especially in the case of lamb. The maximum length of time that lamb meat will remain in a salable condition is 24 to 36 hours. At the end of this time, the lean portions tend to shrink, giving the meat a scooped-out appearance because the fat does not shrink accordingly and meat juices begin to accumulate inside the package.

Frozen bull meat is used almost exclusively for mixing with beef trimmings to produce a leaner ground product. It should be thawed, or at least partially thawed, before grinding. Frozen meats are not only difficult to grind but are hard on the grinder. The only lubrication the auger and knives of the grinder get is from the natural fats of fresh meats, and when these fats are frozen, they lose their lubricating ability.

Packaging Frozen Meat

Frozen meats are packaged in the market in the same way as fresh meats. However, they must almost always be repackaged daily because of the excessive loss of meat juices during thawing. Soakers are sometimes placed inside the package to absorb moisture, but they are seldom satisfactory. Daily repackaging is the safest way to assure correct tare allowances and to add eye appeal to the product.

UNIT E – MEAT PACKAGING AND HANDLING

TOPIC 7 – HANDLING FROZEN MEATS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The maximum temperature for storing frozen meat is __1__ . 1._____

2. Frozen bull meat is used primarily to produce a __2__ ground product. 2._____

3. Cutting frozen meats as close to the time of sale as possible is particularly important with __3__ . 3._____

4. The maximum frozen storage life of lean fish fillets is __4__ to __5__ months. 4._____ 5._____

5. The three basic factors involved in handling frozen meat are __6__ control, __7__ , and __8__ . 6._____ 7._____ 8._____

6. Frozen meats should be stacked __9__ the freezing line in a frozen meat case. 9._____

7. Frozen primal cuts must be put through the power saw at a __10__ rate than fresh primals. 10._____

8. In the preparation of frozen lamb chops, the fell is removed __11__ cutting. 11._____

9. The maximum length of time that thawed lamb meat will remain in a presentable condition is __12__ to __13__ hours. 12._____ 13._____

10. Thawing frozen meat before cutting __14__ its case life. 14._____

UNIT F Market Operation

TOPIC 1 — TYPES OF MARKETS AND MARKET LOCATIONS

This topic, "Types of Markets and Market Locations," is planned to provide answers to the following questions:

- What are the two most common marketing methods?
- What are the six types of markets?
- What are the criteria for the location of the various types of markets?

Meat is sold to the public by two different marketing methods in six different types of meat markets. Many market owners have successfully operated different types of markets by each marketing method, thereby proving that each is workable under certain conditions.

Marketing Methods

The two basic marketing methods are the personalized (conventional) service method and the self-service (open case) method.

Service Method of Marketing

In the service market a qualified meatcutter waits on the customer. He weighs, prices, and wraps the meat selected by the customer. To keep the customer coming back, the meatcutter must have a pleasing personality, a good working knowledge of the meat business, and an attractive meat display.

Self-Service Method of Marketing

Under the newer and more widely used self-service method, the customer has little contact, if any, with the meatcutter because he makes his own selection of meat from an open display case. This type of operation, however, offers a number of advantages. First, it frees the meatcutter from waiting on the customer. Second, it allows the customer to shop for meat at his leisure. And last, it allows the meatcutter to fabricate all meat cuts at one time rather than each time the customer comes to the store. Meat cutting production is speeded up, and a set policy of cutting standards—cutting, trimming, and boning—can be followed in a consistent manner.

One of the main disadvantages of the self-service market is that it sometimes lacks the friendly atmosphere present in the service market, where the meatcutter and customer become well acquainted. Another disadvantage is the constant threat of loss of bloom. When meat is wrapped and sold fresh, the display cases must be checked frequently, and all damaged or suspect packages must be removed. Many meatcutters have gone into the self-service business with the mistaken impression that they only had to cut, package, and display meat; that is, the meat would keep in the self-service case until it was sold. However, experience has shown that this type of operation requires more work in the initial prepackaging stage than the service method and that the meat must be watched just as closely for spoilage.

Types of Markets

The American public purchases most of its meat from six types of markets: individual market, combination meat market and grocery store, supermarket, chain store, locker plant, and discount house.

Individual Markets

The individual meat market, which sells nothing but meat, is one of the oldest types of markets. This market is always a service-type of operation that depends wholly on its location, high quality meats, and outstanding personal service to attract and maintain its clientele. The meatcutter must do his work carefully and must be ready to prepare any cut of meat requested by the customer. He must also be skillful enough in cutting and merchandising to show a profit, even if his operating costs are higher than his competitors'.

Although the number of individual meat markets is gradually dwindling, many of these establishments are still being operated successfully, and in some large cities, they are developing into local chains.

Combination Meat Market and Grocery Store

The combination meat market and grocery store was the forerunner of the one-stop shopping center. In this type of operation, personalized service is as essential as it is in the individual specialized market. Meeting chain store prices is difficult because the buying power of the small market is limited, and the cost of operating is greater in proportion to the volume of business. Since the operator cannot compete in prices with the larger market, he must rely on personal service and quality meats in order to gain and hold customers.

The combination markets may operate by either the service or self-service method. However, since the weekly meat volume in this type of store is almost always low, it is generally a service-type of market. It is difficult to operate a self-service market successfully with a sales volume of less than $3,000 a week. Meat must sell itself in self-service markets, and to do this, it must be shown in fairly large display cases with a good selection of sizes, thicknesses, and number of cuts. To provide these meat cuts on a continuing basis usually results in overcutting, which causes excessive discoloration and spoilage. In a service market, however, meat is usually cut to order, and losses are kept to a minimum.

Supermarkets and Chain Stores

Supermarkets and chain stores are considered together because their operations are similar. The meat sections in these stores strive for large volume business because of their tremendous overhead. As the volume of business increases, the cost of operation goes down proportionately, thus permitting the sale of merchandise at a relatively low price. Also, as the volume of business grows, the work load of each meatcutter increases until he has little time, if any, for time consuming special services.

Markets of this type must carry meat that is comparable in quality to that featured by competitors and must give the best service possible under the circumstances. If large numbers of customers are to be attracted, intensive advertising must be conducted on a large scale. Special bargains must be featured to attract customers in the numbers required to build the volume of sales. At the same time, the meatcutter must be sure that his market has a sufficient supply of meat to meet the demand created by advertising. He must also use the same cutting and trimming procedures used for meat sold at regular prices for preparing the advertised meat. To advertise meat at an attractive price and then be out of it, or to cut and trim it poorly will not only fail to gain new customers for the market but will also cause the loss of regular customers.

Locker Plants

The locker plant, or freezer locker, is a relatively new development in the meat industry. The locker plant operator is basically a wholesaler who sells carcass meat to a customer. He usually adds his cost of wrapping and cutting meats to the customer's price. In addition, the operator may rent the customer a freezer locker in which he can store the meat he has purchased from the locker plant. Quite often, because of the location of the freezer plant and the expense involved in reaching it, the ultimate cost of meat purchased and stored at the locker plant is a little more than it would have been if the customer had bought it at a retail market, particularly at sale prices.

The customer who has a home freezer may purchase his meat at the locker plant or meat market. Many progressive merchants are taking steps to provide this type of service; however, they must wrap all meats that are to be frozen with extreme care so they do not dehydrate and acquire freezer burn. Most meatcutters agree that freezing meat does nothing to improve the flavor or the appearance; in some instances, the meat may be harmed by such storage. The major advantage is in the time saved by both the meatcutter and the customer. The meatcutter can cut and wrap a greater amount of meat in less time, and the customer enjoys the convenience of having a meat supply at home. Locker plants often have a service-type meat department as part of their operation.

Discount Houses

In recent years the number of so-called discount houses has increased throughout the country. This type of store is truly a complete one-stop center. It carries everything from furniture to meats. Groceries and meats are a fairly recent addition to the products handled by this store. The trend is to self-service meat departments that operate in a manner very similar to the chain or supermarket store. In some areas, meats and

groceries are advertised very heavily at very low prices to attract the foot traffic of the entire store.

Meat Market Locations

The meatcutter may want to own a meat market someday. However, he should not consider a business of his own until he is fully qualified in terms of experience, skill, and managerial expertise. The individual who develops these qualities, plus sound business judgment, has the best chance of succeeding in the business.

Importance of Location

The first consideration of the prospective market owner is the choice of a location, which can be almost as important as the choice of a vocation. Given a choice of jobs, the beginning wage earner would undoubtedly choose one that holds the most promise for him. However, he usually does not take this factor into consideration when he invests in his own business. The meatcutter is more likely to enter a business as soon as he has accumulated enough money and finds a market at a low rental or purchase price. Such hasty action is often taken with little regard for the location of the market or for other factors which are vital to the success of a business.

Location Factors

The selection of a market location is dependent upon the type of market as well as the individual owner's capabilities and financial status. Many different types and sizes of markets are in existence. The small neighborhood store that sells only luncheon meats and a few cuts of fresh meats cannot be considered as a true meat market.

Individual meat market. The individual meat market handles nothing but meat on a service basis. These markets are gradually being eliminated, except in isolated sections of the country. The meatcutter should investigate the location very carefully before becoming involved financially in such a store. Most individual markets have been in operation for many years, and a change of ownership or personnel might result in a loss of business because the average customer does not like to see new faces behind the meat counter. A successful individual market must have a considerable amount of pedestrian traffic passing its door each day. In selecting a location for this type of market, operators generally find that the most successful ones are located in large shopping centers near a supermarket, where a good-sized parking lot is provided. Although customers do not mind buying groceries on a self-service basis, many prefer to buy meats on a service basis. Such a market must handle good meat and give the best possible service.

Meat-grocery store. Small independent meat markets in combination meat-grocery stores are typical of the majority of independently owned markets. The meatcutter can find the best opportunities for entering business for himself in this store because the meat department can usually be leased or bought for a reasonable price. However, anyone who intends to buy or lease a meat department should check on the attitude of the community toward the store, the compatibility of the people in the different departments, and the possibilities of future growth. He should also check on the financial level of the community as a whole so that he can determine the quality of merchandise to handle.

The prospective owner should not pay a premium price for the market unless it has an extremely valuable reputation that has been built up over a long period of time. If the market does not have an exceptional record for good, sound business practices, it must be assumed that the trade is transient and the customer may take his business elsewhere at any time. The purchase or rental price should not be unreasonable. If a lease is drawn, it should stipulate the responsibilities of both the lessee and the lessor. The rent for market space is usually 4 to 8 percent of the sales volume, depending on who pays the power bills and advertising costs and whether the delicatessen section belongs to the meat or the grocery department.

Supermarket, chain store, and combination market. The selection of a location for the supermarket, chain store, or combination service and self-service market involves still other considerations. Parking facilities are essential for this type of store. Extensive advertising can induce people to travel some distance to trade in a store, provided the claims of the advertiser are fulfilled. Therefore, supermarkets can be built on the outskirts of a community, where adequate parking can be provided.

A prospective purchaser of a site for this type of market must be absolutely certain that the community is capable of supporting such a store before any building is started. He must also make a careful check of the attitude of the community toward this type of market. Most chain store or supermarket operators will check a location for

months, often years, before they invest. Because of this careful survey, only a few of them go out of business.

Locker plants. Locker plants are usually located in outlying sections of a community, principally because they were originally started for the farm trade. However, many have since expanded to more central locations in the metropolitan areas.

Other factors

Other factors must be considered before an investment is made in a meat market. A store with a fancy front, new equipment, and a fanfare of advertising may attract customers, but the service accorded them and the quality of the merchandise bought, along with a friendly atmosphere in the store, are the attractions that will bring them back.

In summary, the following points should be considered by the prospective market owner:

1. Be sure you are fully qualified to operate a market.
2. Choose a location suitable to your capabilities.
3. Pick a market in a friendly store.
4. Select a market in a progressive store.
5. Choose a location in an area that can support another market.
6. Analyze the competition.
7. Remember that success depends on the market operator.
8. Remember that a large building does not guarantee success.

UNIT F – MARKET OPERATION

TOPIC 1 – TYPES OF MARKETS AND MARKET LOCATIONS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The two basic marketing methods used in meat markets are the __1__ method and the __2__ method. 1._____ 2._____

2. One of the oldest types of meat markets is the __3__ market. 3._____

3. The self-service method of marketing is used extensively in __4__ and __5__ stores. 4._____ 5._____

4. A successful individual market is usually located in a large __6__ __7__ near a __8__ and a __9__ lot. 6._____ 7._____ 8._____ 9._____

5. The first consideration of the prospective market owner is the choice of a __10__. 10._____

6. Locker plants are usually located in __11__ sections of the community. 11._____

7. The so-called __12__ __13__ carries merchandise ranging from furniture to meat and groceries. 12._____ 13._____

8. Supermarkets and chain stores rely on large __14__ sales to cover their tremendous __15__ and to permit the sale of merchandise at __16__ prices. 14._____ 15._____ 16._____

9. One of the main disadvantages of the self-service market is that it sometimes lacks the __17__ __18__ of the service market. 17._____ 18._____

10. The combination meat market and grocery store must offer __19__ service and __20__ meats in order to compete with chain stores and supermarkets. 19._____ 20._____

UNIT F – MARKET OPERATION

TOPIC 2 – MARKET LAYOUT

This topic, "Market Layout," is planned to provide answers to the following questions:

- What should be the first consideration in the layout of a new food store?
- Why is departmental layout important in store planning?
- Which type of market operation needs the most equipment?

The layout and space provisions for meat in any meat market or combination food and meat market play an important part in its success. In the past, the meat department was often relegated to some out-of-the-way spot or cramped area. The location was never very satisfactory because it did not allow the operators to give customers the proper kind of service. The meat department is usually the biggest drawing card for a store, and it should be located so that the customers will also patronize other departments. For this reason, the placement of the meat department should always be given first consideration in the planning of a food store.

Layout of Store

Several basic layouts have been developed for stores with meat departments. The meat department is usually placed in one of the following locations: (1) along the rear wall; (2) along one side wall; (3) along the rear and a side wall, which gives an L-shaped department, or (4) projecting into the center of a store, which gives a U-shaped meat department. The rear wall and side walls are the usual locations of meat departments.

The meat departments in both the service market and self-service market must be provided with ready access to a rear door for receiving supplies—near the storage coolers—and with ample space behind the counter to cut and prepare meats and to keep storage boxes. The department must always be arranged so that the meatcutter can reach his display cases from the rear.

Service markets usually select a location along a side wall within the store, preferably near the produce department. Self-service markets tend to use a location along the rear wall that separates the produce and meat departments. With the latter arrangement, refrigerators and other equipment take up less display space.

The self-service market not only requires more equipment for handling meat but also needs more working area. Both wrapping and cutting require the same amount of space, indicating that the self-service market probably needs twice as much preparation room as the service market.

Layout of Meat Department

The layout of any department or store must be keyed to its use. Appearance is important, but utility is more important.

Service Market

Because the operation of a service market is more or less individualized to each purchase, a flow pattern is not required (Fig. F-1). Meat is brought in the rear door, taken into walk-in boxes, removed and cut on blocks, and then placed in the display case. When meat is sold, it is removed from the case, weighed, and wrapped. All of these operations are geared to the actual time of purchase. Not a great deal of preparation is done ahead of time.

A usual practice in the service market is to assign a specific block to each meatcutter. The meatcutter works only at his assigned block, where he keeps his tools and equipment.

In setting up a service meat department, it is important that a left-handed arrangement is not assigned to a right-handed meatcutter, or vice-versa. The meatcutter's work station should be placed so that he can see customers approach the meat case. If careful consideration is given to this feature, service can be speeded up considerably because the meatcutter is prepared to serve the customer the instant he stops at the counter. If the meat department is laid out incorrectly, the meatcutter is often forced to work with his back to the approaching customer, who may have to call his attention to his presence. This condition does not help to build business because customers usually prefer to trade where the service is prompt and where they can get immediate attention.

Self-Service Market

In the self-service market, emphasis is placed on a flow pattern and on teamwork. The goal is to

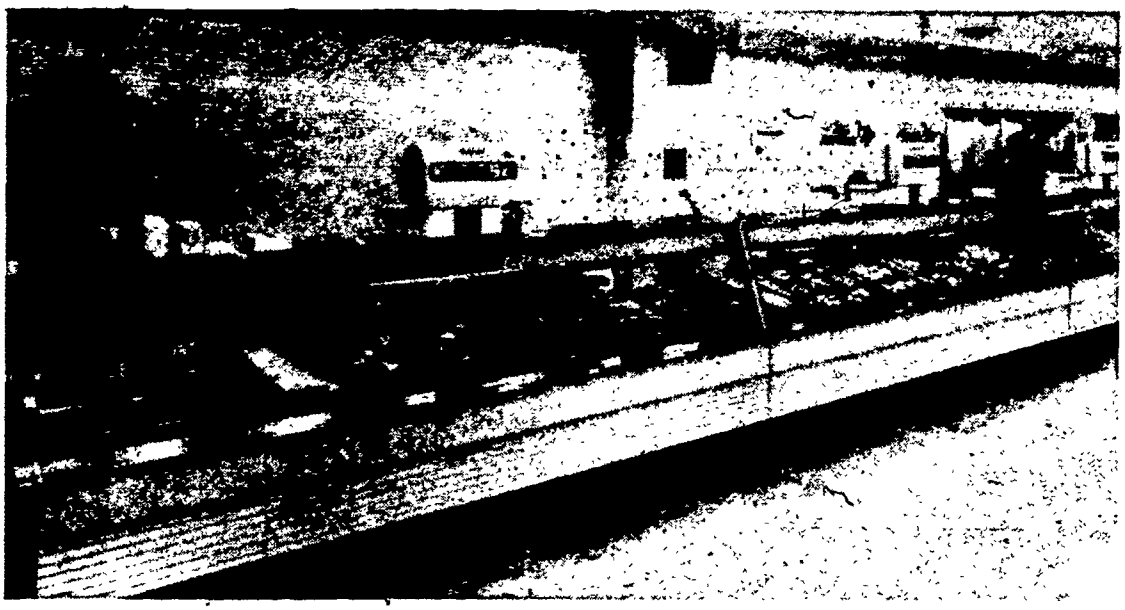

Fig. F-1. Service counter in a service market

move the meat smoothly from the rear door to the display case, with a sufficient number of persons stationed along the way to perform each of the needed operations.

An overhead rail similar to that used in the packing plant is used to facilitate the movement of the meat. Meat brought into the market is hung on tree hooks from the overhead rail. From the receiving door, the meat is moved into the walk-in box, where it may be shunted onto a side rail for storage or may be moved directly into the cutting room.

Many markets have developed a series of feeder rails, which are used to move the oldest meat into the cutting room ahead of newer and fresher meat. In some markets the rails are being replaced by block-ready meat in baskets that are placed on pallets and moved with lift trucks.

After the meat has been delivered to the cutting room, it moves past a series of saws, which meatcutters use to break it down into primal cuts, if necessary, and then into retail cuts. By the time the meat reaches the last of these saws, it is ready to be placed in the bloom box or put on refrigerated conveyors for transfer to the wrappers.

Self-service market operators discovered early that customers like to be able to see the meatcutters and wrappers at work. When self-service was first initiated, the cutting room was sealed from the view of the customers by one-way mirrors. The meatcutters could see out but the customers could not see in. Many customers believed that the meat was being cut and packaged elsewhere and then shipped to the store. They missed the personal contact that they formerly had with the meatcutter. Many market operators soon recognized this fact and replaced the mirrors with clear glass and moved the wrapping operation into the open space immediately behind the display cases.

Mirrors were originally installed because operators felt that customers would not make many requests for service if they could not see the meatcutters. However, this theory proved to be wrong as the number of requests dropped off after the mirrors were removed. Prior to this time, many customers had apparently rung the service bell just to see if anyone was cutting meat.

In most self-service markets, cutting and wrapping is done at stations in full view of customers. The activity of the meat department gives the customer the impression that meat is being sold as fast as it can be cut and wrapped and that the store must be a good place to trade.

When laying out a self-service market, the operator must not forget the special equipment, such as cubing machines, grinders, roast tying machines, cylinder scales, slicers, and the hand-wrapping equipment required for special orders. This equipment should be placed as near as possible to the service bell to save steps for the meatcutter and to enable the customer to watch the operation. When selecting fixtures for a new meat operation, the first consideration should be given to the amount of room available.

Layout of Display Cases

The display case plays an important part in the sale of meat in both the service and self-service market. Each requires a different type of display case and selling techniques.

Service Markets

In service markets the salesmanship of the meatcutter is important in selling the merchandise. He can push certain items by showing them to the customer. But the display in the service case is still very important as it does the initial selling.

Self-Service Markets

In self-service markets personalized salesmanship is almost a thing of the past. The package is virtually its own salesman, and the position of its display in the meat case is of great importance to its sale (Fig. F-2).

The objective of the display case layout is to persuade the customer to shop the entire length of the case. A number of different facts must be determined before the meatcutter can decide how he can best achieve this objective.

Demand items. The meatcutter should determine the demand items for his particular store. In many instances, these items will be determined by the racial and religious background of the people living in the area. Some ethnic groups, for example, may prefer fish, pork and poultry, or beef and lamb. Also, the income of the residents of the neighborhood will determine the demand for expensive or less expensive cuts of meat. The meatcutter should remember that any item advertised at a reduced price should be treated as a demand item for the duration of the advertisement.

Push or impulse items. The meatcutter should establish the push items and impulse items for his

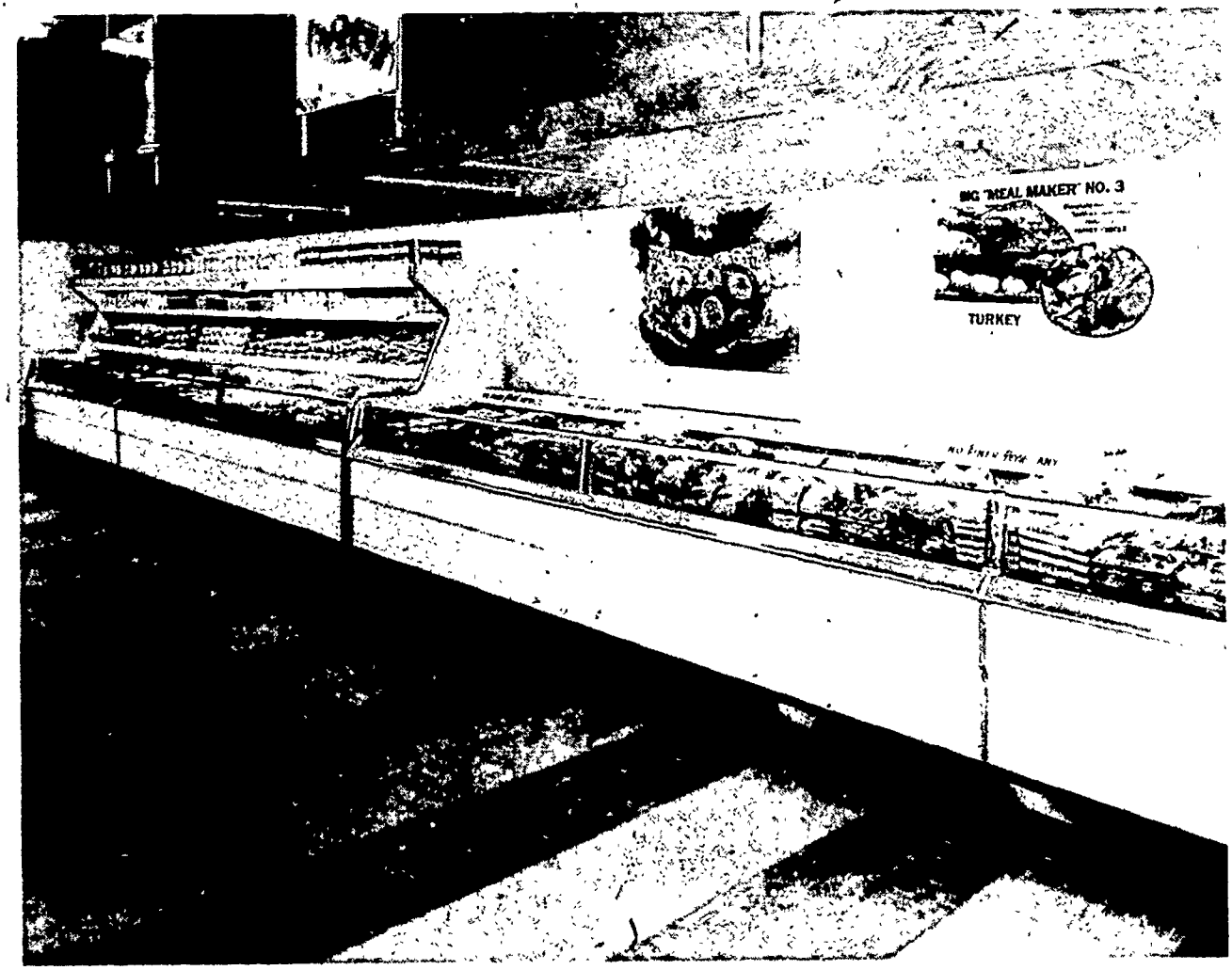

Fig. F-2. Display counter in a self-service market

market. Push items are cuts that do not sell readily in a particular market and, therefore, require extra promotional effort. The importance of impulse items is reflected by the fact that the average customer buys more than 50 percent of his merchandise on impulse. Thus, merchandising of these items determines to a great extent how much profit a market will make.

Flow of traffic. The meatcutter must determine the normal flow of traffic in the store. He can usually get a good idea of traffic flow by watching the customers as they shop the meat case. The ultimate goal is, of course, to have the customers shop the entire length of the case.

Meatcase position. The meatcutter also has to consider the location of the meat case in relation to the store layout. The location will determine where the customer will first come in contact with the meat case. This point is sometimes referred to as the "hot spot" of the case. Some meatcutters may choose to put demand items in the hot spot so that customers do not have to walk the entire length of the case. However, this convenience can defeat the purpose of the entire case lay-out program.

Efficiency. The meatcutter should also take into consideration his own efficiency in arranging meat in the display cases. During the holiday seasons when turkey is a big demand item, he should display it in a location that is near the turkey storage area, thereby avoiding any interference with the regular wrapping operation.

Once the meatcutter has studied his situation and decided what is best for his market, he is ready to plan a layout. Every market has its own characteristics and only the person most familiar with the operation can make the plans.

Among the generalizations that can be made, however, are the desirability of using hot spots for impulse items and of scattering demand items throughout the case. Thus, customers are drawn along the entire length of the case. Also, impulse or push items can be placed beside the demand items.

As a rule, market operators try to group meats according to cooking methods rather than according to the type of meat animal. This is, of course, a matter decided by each operator. Color scheme is also an important consideration for an attractive case.

Many markets use selling aids, such as placing recipes in the meat case, featuring special meats for certain holidays or seasons, and using items with the meat in the display. Also, some markets are experimenting with inserting secondary labels on certain meat items that call attention to such things as "extra thick," "extra thin," or "today's special." A good case man can keep his stock in balance by spreading out the display on long items and closing up on short items.

UNIT F – MARKET OPERATION

TOPIC 2 – MARKET LAYOUT

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The success of any meat market or combination food and meat market is usually dependent on its 1 and 2 provisions. — 1. _____ 2. _____

2. Most meat market layouts require a ready access to a 3 4 and ample 5 behind the 6 to cut, prepare, and store meats. — 3. _____ 4. _____ 5. _____ 6. _____

3. Meat departments in service markets are usually located along a 7 wall near the 8 department. — 7. _____ 8. _____

4. One of the distinctive practices usual in a service market is the assignment of a specific 9 to a specific 10. — 9. _____ 10. _____

5. In the self-service market, the meat department is often located at the 11 wall. — 11. _____

6. The meatcutter's 12 13 in a service market should be placed so that he can see 14 approach the meat case. — 12. _____ 13. _____ 14. _____

7. Special equipment in the self-service market should be placed near the 15 16. — 15. _____ 16. _____

8. As a rule, market operators try to group meats according to 17 18 rather than according to the type of 19. — 17. _____ 18. _____ 19. _____

9. The self-service market requires more 20 for handling meat and more 21 22 to accommodate equipment. — 20. _____ 21. _____ 22. _____

10. The point where the customer first comes in contact with the meat case is called the 23 24. — 23. _____ 24. _____

UNIT F – MARKET OPERATION

TOPIC 3 – KEEPING AND USING RECORDS

This topic, "Keeping and Using Records," is planned to provide answers to the following questions:

- What type of records should be kept?
- How long should records be kept?
- How are records used to determine the financial status of a meat market?
- What is the purpose of an inventory?

Types of Records

The meat market operator must keep records of his purchases, sales, expenses, inventory, and so forth. These records are extremely valuable to the operator for keeping a constant check on the financial status of his business. He must also preserve all business records for at least five years or until a state or federal auditor has inspected them and checked them against the official records.

Purchase Records

The market operator should make sure that he is given a receipt or duplicate of the purchase order for every purchase. The receipt should be kept on file, all needed information should be transferred from the receipt to other pertinent files. This information is very important in the case of tonnage records, which are of great benefit in making future purchases, particularly during the holiday seasons when sales of certain meats increase considerably.

Sales Records

Sales records should be kept up-to-date and available because the market operator may be requested to produce them at any time for inspection by a tax collector or state auditor. Many times a merchant may have difficulties with the federal or state tax authorities simply because he is unable to determine the financial status of the business from his records. When this kind of confusion occurs, an estimate is usually taken of the volume of business done and the profits made, and the tax is levied accordingly. Also, when a merchant is careless with his books, he may not be aware that he is losing money.

Credit Records

Credit and collection records are used only in credit and delivery markets. Some operators of credit stores use rather complicated systems, and others use extremely simple systems. Regardless of how the records are kept, special care must be taken to make all entries correctly and to preserve valuable invoices necessary for the collection of bills. The more complicated the records, the more chances exist for mistakes. A simple system of keeping sales and collection records reduces the chances of making costly errors. Money lost through faulty bookkeeping can never be regained.

Expense Records

One of the most important records in any store is that of expenses. A market operator who does not keep a complete and accurate record of his expenses is certain to encounter bookkeeping difficulties. Even the smallest amount spent should be recorded to keep the accounting record correct. Good business practices call for keeping expenses under control at all times and within a certain percentage of the volume of business.

The market operator should make weekly summaries of his operating expenses and then consolidate them into a monthly balance sheet. These records are an effective means of keeping him advised about his financial status and the soundness of his operational methods. Many market operators are slow to learn that they cannot be successful unless they have some means of determining the condition of their business at all times.

No matter how small the business is, records should be kept of the wages paid and the methods of payments. Such records are required by law for withholding taxes, social security payments, and unemployment insurance deductions.

Tax and license payments are considered as part of the total operating expense of a business, and records of these expenses should be carefully preserved. Individual taxes vary considerably, depending on the size and kind of market being operated and the state and local laws in effect. In

some localities, a tax must be collected on certain items sold over the counter. A record must be kept of this tax. Also a record must be kept of taxes paid on stock purchases, fixtures and equipment, bank balance, and total volume of business done.

Inventory Records

Inventory records are essential in any type of business operation. If a market is to be run successfully, accurate inventories must be taken of stock on hand, and accurate records must be kept of all inventories. These records are of immediate benefit in showing the market operator which meats are selling profitably.

Inventory Methods

Since the inventory is so important to the success of a meat market, the meatcutter should know how to exercise inventory control and how to take an accurate and meaningful inventory of his merchandise.

Inventory Control

The modern meat market operator must be alert at all times to the changing trends in his business if he intends to increase sales and continue to show a reasonable profit. An inventory that is taken carefully and analyzed correctly provides an effective means of keeping a constant check on such situations. As every head meatcutter knows, inventories should be decreased at certain times and at other times they should be increased. The decision should be based on the expected supply and demand. This is called *inventory control.* The meatcutter must know at all times what meat stock he has on hand and why he has it. He must foresee what he will need to have on hand next week or next month, and why he will need it. He must also know whether his stock has cost more or less than it should.

The market operator should always keep his inventory as low as possible and yet be able to have practically any cut of meat on hand for his customers. If he runs a market that follows standard cutting methods rather closely, he does not need to have a very large inventory, unless he has been able to make some unusually good buys. However, if he caters to customers that demand unusual cuts or extensive special cutting, his inventory must be somewhat larger.

Inventory Procedure

If an inventory is to be of any value, it must be taken systematically and accurately. Two people should work together to reduce chances for error in weighing and counting the merchandise. If errors are made, the market operator may be led to think that he is operating at a profit when he is actually losing money.

The first step in an inventory should be to put all stock on hand in some sort of order. All meats of one kind should be placed together and everything should be put in its proper place.

Next, the various types of meat should be classified and each kind listed under the proper classification, such as beef, pork, lamb, veal, poultry, and fish. This will facilitate the task of compiling figures.

The correct inventory value must be determined for each cut of meat. Because the cost charged by the packer for the merchandise is important in determining the retail prices, all invoices should be available for checking purposes. The price listed on the inventory is the expected retail price and not the cost of the item. Therefore, if a piece of meat has obviously gone down in value because of age or deterioration, the market operator must set a realistic selling price on it. The next inventory will show a loss of profit if this is not done. However, in no case should meat be sold, if possible, at less than cost. The details of how a particular market determines its new selling price vary among markets—different markets use different systems.

The sample partial inventory form shown in Fig. F-3 is one example of how to set up an inventory in a market.

Analysis of Operations

The method of determining necessary gross profit shown in a previous topic was based on operating expenses, shrinkage, and sales only. This method does not include any analysis of existing costs of meat or of inventory value. A more complete analysis must be made regularly to include these factors so that the market operator can check the effectiveness of his price structure and determine the exact status of his business.

To facilitate his calculations, the market operator should have a complete record of his expenses on file so that he can make a comprehensive summary whenever necessary. These records must be available at all times so that no guesswork need ever enter into the operation. For example, an inventory shows that the market operator has $952 worth of meat on hand, that his previous inventory was $875, and that he has purchased a total of $4,750 worth of meat since the previous inventory.

MEAT INVENTORY

Store Name or No. _____ Date _____
Head Meatcutter _____

Beef	Weight	Price	Pork	Weight	Price
Beef			Loins–whole		
Hinds			Loins–center cut		
Hinds trimmed			Loins–blade end		
Round (bone-in)			Loins–loin end		
Round (boneless)			New York shoulders		
Rumps (bone-in)			Picnics		
Rumps (boneless)			Butts		
Loins–whole			Legs		
Loins–short			Spare ribs–fresh		
Loins–packing house			Spare ribs–frozen		
Loins–butt (bone-in)			Neck bones		
Loins–butt (boneless)			Fresh side pork		
Tenderloin			Barbecue ribs		
Flank steak			Pork trimmings		
Cube steak			Hog casings		
Forequarters			Smoked ham hocks		

Fig. F-3. Part of a sample inventory form

Also, the inventory shows that the market operator's gross sales were $6,275 and that his expenses were $1,325 for that period. When all the necessary information has been compiled, the market operator can make the following type of summary:

Previous inventory	$ 875.00
Merchandise purchased	+ 4,750.00
Total	$ 5,625.00
Present Inventory	− 952.00
Merchandise used	$ 4,673.00
Gross sales	$ 6,275.00
Merchandise used	− 4,673.00
Gross profit	$ 1,602.00
Expenses	− 1,325.00
Net profit	$ 277.00

Note The amount given for merchandise purchased is based on cost price, whereas the inventory amounts are based on sales price.

- To determine the percent of gross profit, divide the gross profit by the gross sales.

$$6275 \overline{)\,1602.0000} \quad 0.2553 = 25.53 \text{ percent}$$

- To determine the percent of operating expenses, divide the expenses by gross sales:

$$6275 \overline{)\,1325.0000} \quad 0.2111 = 21.11 \text{ percent}$$

- Therefore, net profit represents:

  0.2552 − 0.2111 = 0.0442 or
  4.42 percent of gross sales

Chain markets frequently bill their outlets in terms of sales price rather than cost. In this case, the head meatcutter cannot analyze his operations because he has no meat costs. He usually sends his records to the company and receives a report based on his records and the company's cost information. However, he should know how these reports are calculated so that he can appreciate the need for complete and accurate records.

UNIT F – MARKET OPERATION

TOPIC 3 – KEEPING AND USING RECORDS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. All business records should be kept at least 1 years or until they have been inspected by a 2 or 3 auditor. — 1. _____ 2. _____ 3. _____

2. If an inventory is to be of any value, it must be taken 4 and 5 . — 4. _____ 5. _____

3. One of the most important records in any business is that of 6 . — 6. _____

4. The weekly summary and the monthly balance sheet are an effective means of keeping the market operator advised of his 7 8 . — 7. _____ 8. _____

5. When a market operator is careless about keeping his books, he may not be aware that he is 9 money. — 9. _____

UNIT G Safety and Sanitation

TOPIC 1 – OCCUPATIONAL SAFETY AND HEALTH LAWS

This topic, "Occupational Safety and Health Laws," is planned to provide answers to the following questions:

- **What is the purpose of the Williams-Steiger Act of 1970?**
- **What agency is responsible for enforcing the California Occupational Safety and Health Act of 1973?**
- **What are the responsibilities of the employee and employer under federal and state occupational safety and health laws?**

Federal and state occupational safety and health laws have been written and adopted as a means of making accident controls more effective and improving working conditions. Two of the most significant pieces of legislation enacted to deal with these problems are the Williams-Steiger Occupational Safety and Health Act of 1970 and the California Occupational Safety and Health Act of 1973.

Williams-Steiger Act of 1970 (Occupational Safety and Health)

In passing the Williams-Steiger Occupational Safety and Health Act of 1970, the federal government declared safety on the job to be everyone's responsibility.

Responsibility of Employers

The Williams-Steiger Act requires that each employer furnish his employees a place of employment that is free from recognized hazards that might cause serious injury or death. The act further requires that employers comply with the specific safety and health standards issued by the U.S. Department of Labor.

Responsibility of Employees

Pursuant to provisions of the Williams-Steiger Act, each employee must comply with safety and health standards, rules, regulations, and orders issued under the act and applicable to his personal conduct.

Administration of the Williams-Steiger Act

The U.S. Department of Labor conducts periodic inspections of job sites to ensure compliance with safety and health requirements. The inspections are conducted by trained safety and health compliance officers. The law requires that an authorized representative of the employer and representatives of the workers be given an opportunity to accompany the inspector. Workers are also entitled to notify the Department of Labor of violations and to request an inspection. Violations may result in a citation and a proposed penalty. The mandatory penalties are quite severe, and criminal penalties are provided for in the act. No employee may be discharged or discriminated against for filing safety and health complaints.

Permanent management of health and safety programs by individual states is contingent upon the Department of Labor's approval of state plans to implement programs as effective as those required by the Williams-Steiger Act. California's plan was approved in May, 1973.

Keeping Informed

A convenient reference guide for the Williams-Steiger Act is available from any regional office of the Labor Department's Occupational Safety and Health Administration.

California Occupational Safety and Health Act of 1973

The California Occupational Safety and Health Act of 1973 (CAL/OSHA) was enacted (1) to ensure safe and healthful working conditions for all California working men and women through enforcement of effective standards; and (2) to help employers to maintain safe and healthful working conditions in their places of employment.

Administration

The administration of the CAL/OSHA plan is the responsibility of the California Agriculture and Services Agency, and all authority to make and enforce rules is vested in the California State Department of Industrial Relations through its Division of Occupational Safety and Health.

In enforcing all standards and the *Construction Safety Orders,* the division may do any of the following:

1. Declare and prescribe what safety devices are well adapted to ensure safety and safe places of employment for employees.
2. Enforce standards and orders adopted by the Occupational Safety and Health Standards Board for the installation, maintenance, and operation of safeguards.
3. Require the performance of any act reasonably required for the protection and safety of employees.

Inspections

When the Division of Occupational Safety and Health learns or has reason to believe that any place of employment is unsafe, it may, on its own motion or upon receiving a complaint, conduct an inspection with or without a notice or hearing. Only the division chief or, in his absence, his authorized representatives will have the authority to permit advance notice of an inspection. When an inspection is to be made as a result of an employee complaint, advance notice shall be given only in those cases involving imminent danger to an employee.

After presenting appropriate credentials to the employer, division representatives shall have free access to any place of employment for the purpose of making an inspection or investigation; any person who obstructs or hampers such action is guilty of a misdemeanor.

Representatives of both the employer and the employees have the right to accompany any division representative while he makes an inspection and can privately discuss safety violations or problems with him at that time. If an employee representative is not designated, the inspector may consult with a reasonable number of employees during his inspection.

Citations

When the Division of Occupational Safety and Health determines through its inspection that an employer has violated any standard, rule, order, or regulation, the division should issue a written citation as soon as possible after the violation; however, the citation must be issued within six months of the occurrence of the violation. A copy of each citation issued must be posted for three days or until the unsafe condition is abated, whichever is longer. In the case of citations issued for serious violations, the division must reinspect at the end of the period of abatement.

Investigations

The Division of Occupational Safety and Health will investigate the causes of any fatal accident or of any accident that results in a serious injury to five or more employees. (The term *serious injury* will be defined in a later section.) The division may investigate also the causes of any other employment-related accident or illness that has caused or could cause a serious injury.

The Bureau of Investigations within the Division of Occupational Safety and Health is responsible for directing investigations of accidents that involve violations of standards or orders, serious injury, death, or a request for prosecution by a division representative. The preparation of cases for prosecution will also be handled by the Bureau of Investigations.

The authorized representatives of the bureau have the right to enter all places of employment to conduct their investigations, and they may collect any evidence they deem necessary. The results of an investigation shall be referred for appropriate action to the city attorney or district attorney having jurisdiction over the case.

Complaints

When an employee files a complaint with the Division of Occupational Safety and Health that a place of employment is unsafe, the division must investigate the complaint within three working days, with or without notice or hearing. If several complaints are to be investigated, those involving serious hazards will be given priority. Action against employees subsequent to their complaining of unsafe conditions is forbidden under CAL/OSHA, and the name of any person filing a complaint shall be kept confidential upon the request of the complainant.

No employee can be laid off or discharged for refusing to work where any safety or health standard is violated and where such violation creates a hazard to the employee or his fellow workers. An employee who believes that he has been discharged unfairly or otherwise discriminated against may file a complaint with the Labor Commissioner.

Restrictions for Hazardous Conditions

If the condition of any place of employment or the operation of any piece of equipment constitutes a serious hazard to employees, the Division of Occupational Safety and Health may ask the courts to issue an injunction that would restrain operations until the hazardous condition is corrected. The division may also prohibit entry into the place of employment, or it can forbid the use of the equipment. Notice of such action by the division must be posted in a conspicuous place in or at the place of employment. Only an authorized representative of the Division of Occupational Safety and Health may remove the notice, which shall be done at such time as the place of employment or piece of equipment has been rendered safe.

Safety Notices

It is the duty of the Division of Occupational Safety and Health to prepare safety notices for employers to post in their places of business. The safety notices should contain pertinent information about safety rules and regulations, the location of the nearest division office, the employees' rights, and any other information the division deems necessary. The division must ensure that these notices are printed in both English and Spanish. Regulations on the content of safety notices, their location, and the number to be posted by employers are made at the discretion of the division.

Occupational Safety and Health Standards Board

The agency responsible for occupational safety and health standards and orders in California is the Occupational Safety and Health Standards Board within the Department of Industrial Relations. The board consists of seven members appointed by the Governor. All meetings held by the board are open to the public, and notice of the meetings shall be published in major newspapers throughout the state.

Role of the State Department of Health Services

In helping to enforce occupational safety and health standards, the State Department of Health Services will do the following:

1. Help inspect specific workplaces to evaluate occupational health programs or environmental conditions that may be harmful to the health of employees.
2. Upon request and under certain circumstances, conduct special investigations of occupational health problems that are unrelated to any specific enforcement action.
3. Provide for safety engineers of the Division of Occupational Safety and Health a continuing program of training in the recognition and handling of health hazards.

Safety Education

The Division of Occupational Safety and Health is directed to maintain a program of education and research to provide the following:

1. Inservice training for division personnel
2. Safety education for employers and employees
3. Research and consulting services to any employer or employee group requesting such services

The division is responsible for preparing and distributing information concerning occupational safety and health programs and methods. Safety training programs will be provided upon request, but priority for the development of training programs will be within those occupational areas where the greatest hazards exist. Consulting services include furnishing information, advice, and recommendations for maintaining safe and healthful work practices.

Employer and Employee Responsibilities

Every employer shall furnish employment and a place of employment that are safe and healthful for his employees. The employer shall furnish and require the use of necessary safety devices and safeguards and shall adopt and use work practices and processes that are adequate for the safety and health of his employees; the employer must do everything reasonable to protect his workers. Under no circumstances can an employer require or permit an employee to work where safety and health standards are not met.

Each employee, as well as every employer, must comply with safety and health standards and with all rules, regulations, and orders that are applicable to his own actions and conduct. No person may do any of the following:

1. Remove, displace, destroy, or take any safety device, notice, or warning.
2. Interfere in any way with the use of any safety device by another person.
3. Interfere with the use of any method or process adopted for the protection of any employee, including himself.
4. Fail or neglect to do everything in his power to protect employees.

Information Provided by Employers

Under prescribed conditions each employer must provide his employees with specific information pertaining to their safety on the job. To comply with this requirement, employers must do the following:

1. Post information regarding protections and obligations of employees under occupational safety and health laws.
2. Post prominently each citation issued.
3. Provide the opportunity for employees or their representatives to observe monitoring or measuring of employee exposure to hazards.
4. Allow employees or their representatives access to accurate records of employee exposures to potentially toxic materials.
5. Provide notification to any employee who has been or is being exposed to toxic materials in levels exceeding those prescribed by an applicable standard, order, or special order; and inform any employee so exposed of the corrective action being taken.

Serious Injury or Illness

Serious injury or illness is defined as any employment-related injury or illness that (1) requires inpatient hospitalization for a period in excess of 24 hours for other than medical observation; or (2) causes an employee to suffer the loss of any member of the body or any serious degree of permanent disfigurement. Injuries resulting from a violation of the California State Penal Code (except Section 385) or from an accident on a public street or highway are not within the jurisdiction of the Division of Occupational Safety and Health.

Variations from Standards

With approval from the Occupational Safety and Health Standards Board, an employer may be granted a variance from a prescribed regulation.

Permanent variance. To receive a permanent variance, an employer must satisfy the board that he will provide an alternative program or a method of equal or superior safety for his employees.

Temporary variance. A temporary variance can be granted by the Standards Board if an employer establishes that:

1. He is unable to comply with the prescribed standard by the effective date because resources cannot be located.
2. He is doing everything possible to safeguard his employees against hazards covered by the regulation in question.
3. He has an acceptable program for complying with the regulation as quickly as possible.

Project Permits

Some types of work involve a substantial risk to employees. In these special cases an employer must be issued a permit by the Division of Occupational Safety and Health prior to the beginning of the work. Some examples of work for which the division must issue project permits are (1) construction of trenches or excavations that are 5 feet deep or more and into which a person is required to descend; (2) construction of any building, structure, falsework, or scaffolding work more than 3 stories high; and (3) demolition of any building, structure, falsework, or scaffolding more than 3 stories high.

Appeals

Any employer who is served with a citation has the right to appeal.

Occupational Safety and Health Appeals Board. The Appeals Board consists of three members appointed by the Governor to represent management, labor, and the general public. Each member is appointed to serve a term of four years.

Appeals procedures. An employer who receives a citation or a notice of a civil penalty may submit an appeal to the Appeals Board within 15 working days of the date he received the citation or notice. He may appeal with respect to alleged violations, abatement periods, or the amount of proposed penalties.

Within 30 days after a case is submitted, the Appeals Board or a hearing officer will make a decision on the appeal and will file an order or decision. Persons affected by this order or decision may, within the time limit specified, apply to the superior court for a writ of mandate for the purpose of determining the lawfulness of the original order or decision or the lawfulness of the order or decision following reconsideration.

Keeping Informed

A complete text of the California Occupational Safety and Health Act is available from the Division of Occupational Safety and Health, 525 Golden Gate Ave., P.O. Box 603, San Francisco, CA 94101.

UNIT G – SAFETY AND SANITATION

TOPIC 1 – OCCUPATIONAL SAFETY AND HEALTH LAWS

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The Williams-Steiger Occupational Safety and Health Act of 1970 makes safety on the job 1 responsibility. 1._____

2. In California any employment-related injury that requires inpatient hospitalization for more than 2 hours is considered to be a serious injury. 2._____

3. The authority to make and enforce rules under CAL/OSHA is vested in the California State Department of Industrial Relations through its Division of 3 4 and 5. 3._____ 4._____ 5._____

4. Any person who obstructs an investigation by the Division of Occupational Safety and Health is guilty of a 6. 6._____

5. No employee can be laid off or discharged for refusing to work where any safety or health standard is 7. 7._____

6. Any employer who willfully violates any CAL/OSHA standard and causes the death or permanent impairment of an employee may be, if convicted, fined up to 8, or sentenced to serve 9 months in jail, or 10. 8._____ 9._____ 10._____

7. In every case involving a serious 11, 12, or 13, a report must be made immediately by the employer to the Division of Occupational Safety and Health. 11._____ 12._____ 13._____

8. It is a misdemeanor for any person to remove or displace 14 devices or 15 notices used for the protection of workers or other persons. 14._____ 15._____

9. In cases where the work involves substantial risk to employees, the employer must obtain a 16 from the Division of Occupational Safety and Health. 16._____

10. The Occupational Safety and Health Standards Board is the only agency in the state authorized to adopt occupational safety and health 17. 17._____

UNIT G – SAFETY AND SANITATION

TOPIC 2 – PERSONAL HYGIENE

This topic, "Personal Hygiene," is planned to provide answers to the following questions:

- **What are the meatcutter's responsibilities regarding personal hygiene?**
- **How can personal hygiene affect the business of a market?**
- **What are some general rules of personal hygiene?**

Personal hygiene concerns the cleanliness practiced by the meatcutter, such as grooming and other individual habits. It is essential to the operation of a meat market that he have a neat, clean appearance. The meatcutter's appearance, just as that of his market, gives the customer an indication of the cleanliness and sanitation practiced in handling meat. The customer usually judges by first impressions until he becomes familiar with the meatcutter and the market operation. If the customer forms a poor impression during his first visit, he may never return to the market.

Personal hygiene is a way of life. It is a standard that must be maintained by anyone who wishes to become successful in the meatcutting profession. The following are some general rules that should be observed for good personal hygiene:

1. Bathe daily.
2. Shampoo hair regularly.
3. Keep fingernails clean.
4. Brush teeth daily.
5. Be clean shaven. If the employee has a mustache, it must be kept short and well trimmed.
6. Use a deodorant regularly, if required.
7. Keep hair cut and well groomed.
8. Wear a cap or hair net.
9. Wear clean clothes.
10. Use paper tissue rather than a handkerchief. Wash hands following use of a tissue.
11. Smoke in restrooms and lounges only. Do not smoke over food or in the area.
12. Wash hands on returning to work area.
13. Wash hands before leaving the restroom.
14. Keep fingers out of the mouth.
15. Do not chew gum or tobacco during working hours.
16. Be neat about personal habits.
17. Have a health examination once a year, including a chest X ray.

UNIT G – SAFETY AND SANITATION

TOPIC 2 – PERSONAL HYGIENE

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The apprentice meatcutter should have a __1__ examination regularly every __2__.
2. When working over food, the meatcutter should never __3__.
3. The meatcutter's __4__ is usually an indication of the __5__ of the market.
4. All personnel involved in the handling and cutting of meat should always wash their hands following the use of a __6__, before leaving the __7__, and on returning to the __8__ __9__.
5. If an employee has a mustache, it must be kept __10__ and well __11__.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

UNIT G – SAFETY AND SANITATION

TOPIC 3 – PLANT AND MARKET SANITATION

This topic, "Plant and Market Sanitation," is planned to provide answers to the following questions:

- What is the purpose of health regulations?
- Why is it important that sanitation laws be observed at all times?
- Why should the meatcutter familiarize himself with the sanitation procedures?

The subject of health and sanitation involves three considerations. The first consideration is the health of the consumer; all harmful ingredients should be eliminated from the consumer's diet, and food should be prepared in a sanitary manner in a sanitary area. The second consideration is to make sure that the people preparing the products are free of disease. And the final consideration is to control working conditions to protect the worker as much as possible.

Sanitation Guidelines

For safe, sanitary food service, the meatcutter should comply with the following guidelines:

1. All plans for new buildings must be approved.
2. All labels and markings on containers used for shipping or selling must be approved.
3. A supply of hot water not less than 180° F. must be furnished and used for cleaning purposes.
4. All employees may be required to pass a physical examination.
5. The floor, walls, ceilings, partitions, posts, doors, and structures must be of materials that may be readily and thoroughly cleaned.
6. All cleaning agents should be USDA approved.
7. The rooms and compartments in which any product is prepared or handled should be free from dust, odors, insects, or rodents.
8. A sufficient number of dressing rooms, toilet rooms, and urinals should be conveniently located in the plant or market.
9. Acceptable lavatories, including running hot and cold water, soap, and towels, should be located in or near toilets or urinal rooms to ensure cleanliness of all persons handling any product.
10. Proper facilities should be provided for cleansing and disinfecting utensils and hands of all persons handling any product.
11. Scabbards and similar devices used for the temporary retention of knives, steels, and the like, should be of a type that may be readily cleaned and kept clean along with knives.
12. Aprons, frocks, and other outer clothing should be clean at the start of each working day and should be changed during the day when required.
13. Practices such as spitting on whetstones; spitting on the floor; placing skewers, tags, or knives in the mouth; or testing receptacles with air from the mouth are prohibited. Pressure testing should be done by mechanical means.
14. Any person showing evidence of a communicable disease in a transmissible stage, or known to be a carrier of such disease, or affected with boils, sores, infected wounds, or other abnormal sources of microbiological contamination should not be employed in a department where food is handled.
15. When any equipment, utensils, rooms, or compartments are tagged for unsanitary reasons, the tag cannot be removed, or the area used until the tag has been removed by the inspecting agency.
16. Caps and hair coverings must be worn.
17. Smoking must be done in rest rooms only.

Enforcement Agencies

Agencies that enforce sanitation regulations throughout the meat industry include state and local health departments, state meat inspection department, consumer protection bureaus, federal meat department, and the Pure Foods and Drug Administration.

UNIT G – SAFETY AND SANITATION

TOPIC 3 – PLANT AND MARKET SANITATION

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. Any person showing signs of a __1__ disease, or affected with __2__, __3__, or __4__, or other infectious diseases should not be employed where __5__ is prepared.

2. Smoking in the market should be done in the __6__ __7__ only.

3. A water supply of not less than __8__ must be furnished for cleaning.

4. Market personnel should put on clean __9__ or __10__ at the start of the workday.

5. Practices such as testing receptacles with air from the __11__ are prohibited.

1._____
2._____
3._____
4._____
5._____
6._____
7._____
8._____
9._____
10._____
11._____

UNIT H Workers' Legal Rights and Benefits

TOPIC 1 – FEDERAL LAWS OF SPECIAL INTEREST TO THE WORKER

This topic, "Federal Laws of Special Interest to the Worker," is planned to provide answers to the following questions:

- **What is social security, and how does it protect the worker?**
- **Who is eligible for social security benefits?**
- **What are the three kinds of payments made under the social security law?**
- **What federal laws deal with minimum wages, worker's rights, union shops, and working conditions?**

Since 1935 the federal government has provided old age and survivor's insurance to workers and their dependents who qualify under the social security law. Nine out of ten workers in the United States are participating in the social security program. This topic explains the major provisions of the social security law and gives information about several other federal laws of concern to the workers.

Social Security Law

The federal social security law provides for the following. (1) monthly retirement payments to eligible insured workers and, under certain conditions, to their spouses and dependent children, (2) monthly survivors' payments to widows, widowers, or other dependents of deceased fully insured workers, and (3) payments to totally disabled injured workers under sixty-five years of age and to certain of their dependents. The social security law also makes provisions for health insurance (medicare) for most persons sixty-five and over.

Federal old age and survivors insurance is paid for by equal tax contributions from both the worker and the employer. The worker's share of this tax is deducted from his pay; it is listed under FICA (Federal Insurance Contributions Act) on his paycheck stub. The amount of annual tax the worker pays has a maximum limit, and if he has paid any excess tax, he may deduct it when he files his federal income tax.

Retirement Benefits

To be eligible for retirement benefits under the current provisions of the social security law, the worker must be fully insured and at least sixty-two years of age. A worker is fully insured under the social security law when he has completed the required number of calendar quarters of covered employment (from six to 40 quarters, depending on the year in which he will be sixty-two). Monthly payments can also be made to an insured retired workers' spouse if the spouse is at least sixty-two years of age; to an insured retired worker's spouse under sixty-two if the spouse is caring for the worker's child who is under eighteen or disabled and receiving benefits based on the retired worker's earnings, to an insured retired worker's unmarried children under eighteen (age twenty-two, if full-time students), and to an insured retired worker's unmarried son or daughter who is eighteen or older and who was severely disabled before age twenty-two and continues to be disabled.

Retirement benefit amounts depend on the retired worker's average earnings under the social security program, his earnings (if any) during retirement, and the age at which he elects to start receiving benefits. (A worker retiring between the ages of sixty-two and sixty-five will receive smaller monthly payments than he would if he retired at age sixty-five.)

Survivors' Benefits

If a worker is fully insured at the time of death, his widow (or widower) can receive social security benefits if the survivor is sixty or older or caring for dependent children who are eligible for benefits based on the worker's record. The law also provides benefits for the deceased worker's depen-

dent children and dependent parents (if the latter are sixty-two or older). Benefits may be available to certain survivors even if the worker was not fully insured at the time of death. In addition to monthly payments for survivors, a small lump sum payment may be made after the worker's death.

Disability Benefits

If a fully insured worker becomes disabled and is unable to work for a long time before he attains the age of sixty-five, he and certain family members may be eligible for disability payments. To qualify, the worker must be fully insured and have social security credits for five years or more of work in the ten-year period immediately preceding the onset of the disability. This time requirement has been reduced for younger workers who become disabled. For a worker disabled before the age of twenty-four, for example, the requirement is one and one-half years of work credits in the three-year period preceding the disability. The disability must prevent the claimant from doing any substantial gainful work and must be in accordance with other standards prescribed in the law.

Social Security Card

As soon as he starts on his first covered job, the apprentice meatcutter should obtain a social security card, which records his permanent social security account number. He will be asked to show this card to every employer for whom he works. The account number is used by the Social Security Administration to keep a record of the worker's earnings and of any benefits to which the worker and the worker's dependents become entitled under the law. Reference must be made to the account number in any application for social security benefits.

Keeping Informed

The social security law has undergone many changes over the years. The worker can obtain specific and current information concerning eligibility for retirement and other benefits under the law, determine his current insurance status, or get answers to any other questions relating to the program at local offices of the Social Security Administration, U.S. Department of Health and Human Services.

Other Federal Laws Affecting Workers

Among other federal legislative acts that are of particular concern to workers are the Fair Labor Standards Act, the Walsh-Healy Act, the Davis-Bacon Act, the Taft-Hartley Act, and the Landrum-Griffin Act.

Labor Standards

The *Fair Labor Standards Act* establishes minimum wages and maximum hours for workers engaged in interstate commerce or in the production of goods for interstate commerce. Although this law does not directly affect many workers in the skilled trades, it does tend to raise wages and decrease working hours for workers in general.

The *Walsh-Healy Act,* as amended, establishes standards for pay and working conditions for persons employed under federal government contracts. This legislation, like the Fair Labor Standards Act, has the effect of promoting better working conditions and raising pay levels not only for those directly affected but also for workers in general.

The *Davis-Bacon Act* requires that workers on federal contracts and subcontracts of more than $2,000 must be paid the prevailing rates of the area in which the work is done. It also provides that workers on such jobs who have been underpaid will receive compensation from the federal government in the amounts required to make the proper pay adjustments.

Labor Relations

The *Taft-Hartley Act* (the Labor-Management Relations Act) is an amendment to the National Labor Relations Act (Wagner Act of 1935). The Labor Relations Act as amended guarantees the right of workers to organize and bargain collectively with their employers, permits the existence of a union shop, prohibits a closed shop, and requires an 80-day cooling-off period before a strike or lockout can be called. The Taft-Hartley Act contains a number of other provisions, some of which are of concern to the worker in his relations with his union and his employer.

The *Landrum-Griffin Act* (Labor-Management Reporting and Disclosures Act) outlines a "bill of rights" for union members; requires labor organizations and employers to report regularly on certain of their activities; sets standards regarding union elections, the handling of union funds, and the qualifications of union officers; and prohibits secondary boycotts, certain kinds of strikes and picketing, and certain kinds of labor contracts.

UNIT H – WORKERS' LEGAL RIGHTS AND BENEFITS

TOPIC 1 – FEDERAL LAWS OF SPECIAL INTEREST TO THE WORKER

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. To be eligible for disability benefits under the social security law, a worker must be 1 insured and must have a 2 that will prevent him from working for a long time. — 1. _____ 2. _____

2. Social security is paid for by equal tax contributions from both the 3 and the 4. — 3. _____ 4. _____

3. The worker's social security card records his permanent 5 6, which is used to keep track of any 7 or 8. — 5. _____ 6. _____ 7. _____ 8. _____

4. The Landrum-Griffin Act outlines a "bill of rights" for 9 10. — 9. _____ 10. _____

5. Retirement benefit amounts depend upon the retired worker's 11 earnings under social security, his earnings during 12, and his 13 at retirement. — 11. _____ 12. _____ 13. _____

6. The Taft-Hartley Act permits the 14 shop but prohibits a 15 shop. — 14. _____ 15. _____

7. Social security checks are not subject to 16 17 tax. — 16. _____ 17. _____

8. The Walsh-Healy Act, like the Fair Labor Standards Act, has the effect of promoting better working 18 and raising the 19 levels of workers. — 18. _____ 19. _____

9. Under social security, a 20 - 21 payment also can be made when a worker dies. — 20. _____ 21. _____

10. The coverage of social security was expanded in 1965 with the enactment of 22, which assured hospital and medical insurance protection to people 23 and over. — 22. _____ 23. _____

UNIT H – WORKERS' LEGAL RIGHTS AND BENEFITS

TOPIC 2 – THE CALIFORNIA WORKERS' COMPENSATION LAW

This topic, "The California Workers' Compensation Law," is planned to provide answers to the following questions:

- **What is the California workers' compensation law, and how does it protect the worker?**
- **What benefits are available to the worker under the California workers' compensation law?**
- **What procedure should be followed in filing a claim for workers' compensation benefits?**

The basic purpose of the California workers' compensation law is to ensure that an employee who suffers an industrial injury, as well as those who depend upon him, will have adequate means of support while he is unable to work and that provision will be made for any medical treatment he may need as a result of the injury. Every employee should know his rights under this law and should know how to secure compensation when he is eligible.

Provisions and Benefits of the Law

With few exceptions, most California employers are required to guarantee payment of compensation to employees who suffer industrial injury. This includes part-time and full-time employees. Each employer is required to post a notice either giving the name of his workers' compensation insurance carrier or stating that he is self-insured.

Medical Benefits

Under the workers' compensation law, all medical treatment a worker may require as a result of an industrial injury must be provided for by the employer or his insurance company. If the employer fails to provide for such medical care, the employee should secure the required treatment for himself and, through the California Compensation Appeals Board, seek assistance in making the employer pay for the cost of treatment. The cost of medical treatment includes wages lost because of time taken off for medical examinations, cost of transportation, meals, and lodging provided they are reasonable, and payment for the examination, X rays, and laboratory tests needed to prove the workers's claim. If the company employs a regular doctor, the worker must submit to examinations by the doctor at reasonable intervals or possibly be denied benefits.

Temporary Disability Benefits

If a worker is disabled for more than three days after the date of the injury, he can receive weekly disability payments to partially offset his loss in earning power during the rest of the time he is disabled. Payment normally starts on the fourth day after injury; however, if the injury results in a disability that lasts for more than 21 days, or necessitates hospitalization, payment is also made for the first three days of disability.

Permanent Disability Benefits

If an on-the-job injury reduces the worker's earning power, impairs his use of a member such as a leg, an arm, or an eye, or causes him to be handicapped in competing for a job, he is considered to have at least a partial permanent disability. In these cases the worker may receive compensation for a specified period of time and up to a certain maximum amount per week, depending on his earnings and the rating assigned to his disability by the Division of Industrial Accidents. If the worker is rated 70 percent or more disabled, he can receive a lifetime pension after his regular weekly benefits expire.

Subsequent Injuries Payments

An employee with a prior injury or disablement who is further injured at work may be entitled to benefits from the Subsequent Injuries Fund if the combined effect of the new injury and the earlier disablement equals a rating of 70 percent or more and if certain other conditions are met. Benefits depend on the rating of the new injury and its relation to the old injury.

Death Benefits

Under the law, certain benefits are available to the survivors of a worker whose industrial injury

results in his death. These benefits include burial allowance for the deceased worker and a substantial death benefit payment to the worker's widow, dependent children, or other specified dependents.

Penalties Provided by the Law

The employer may be penalized by an increase of awards if the injury to an employee was caused by his own serious and willful misconduct, if he unreasonably delays or refuses payment of benefits, or if an illegally employed minor is injured. The worker, on the other hand, may forfeit some or all of his benefits if his injury was caused by his own serious or willful misconduct.

Reporting Injuries and Making Claims

The worker should notify his employer, supervisor, or foreman immediately of any on-the-job injury or claim of injury. If he should fail to give such notice within 30 days after being injured, his claim for compensation could be denied.

The employer is required by law to report the claim of injury to his insurance company and to the state. Usually the employer or his insurance company contacts the worker and arranges for payment of benefits. However, if the worker finds that the payments are not forthcoming or are unreasonably delayed, he may apply to the Division of Industrial Accidents or any of its district offices for assistance.

If a worker must make an application to the Division of Industrial Accidents, it must be filed within a year from the date he was injured, or within one year from the date he received his last medical treatment or benefit payment. An application for death benefits must normally be filed within one year from the date of death.

Keeping Informed

Additional information about the workers' compensation law may be obtained from any office of the Division of Industrial Accidents. Division offices are located in many cities throughout the state.

UNIT H – WORKERS' LEGAL RIGHTS AND BENEFITS

TOPIC 2 – THE CALIFORNIA WORKERS' COMPENSATION LAW

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The California workers' compensation law provides for __1__ treatment and a means of __2__ for an employee who suffers an __3__ injury. 1. _____ 2. _____ 3. _____

2. Subsequent injury payments depend on the __4__ of the new injury in __5__ to the old. 4. _____ 5. _____

3. The employer may be penalized by an __6__ of awards if the injury was caused by his __7__ misconduct. 6. _____ 7. _____

4. The worker can __8__ some or all of his benefits if the injury is caused by his own willful __9__. 8. _____ 9. _____

5. To receive a lifetime pension, a worker with a permanent disability must be rated __10__ __11__ or more. 10. _____ 11. _____

6. If a worker fails to notify his employer of an injury within __12__ days, his claim for compensation could be __13__. 12. _____ 13. _____

7. Payment is made for the first week of a disability if it lasts more than __14__ days or if __15__ is required.. 14. _____ 15. _____

8. Temporary disability payments normally start the __16__ day after __17__. 16. _____ 17. _____

9. The employer is required by law to __18__ all injury claims within __19__ days after he learns of the injury. 18. _____ 19. _____

10. Under the law, certain benefits are available to survivors of a worker whose __20__ injury results in his __21__. 20. _____ 21. _____

UNIT H – WORKERS' LEGAL RIGHTS AND BENEFITS

TOPIC 3 – SERVICES OF THE CALIFORNIA DEPARTMENT OF EMPLOYMENT DEVELOPMENT

This topic, "Services of the California Department of Employment Development," is planned to provide answers to the following questions:

- **What services does the California Department of Employment Development offer to unemployed persons?**
- **What direct benefits are available to unemployed persons in California?**
- **What should a worker do as soon as he becomes unemployed?**
- **What factors may disqualify an unemployed person from receiving benefits?**

The California Department of Employment Development (EDD) provides three major services to workers in the state:

1. Operates a statewide system of public employment offices to help unemployed persons to find work.
2. Pays unemployment insurance benefits to eligible unemployed workers.
3. Pays disability insurance and hospital benefits to covered workers who are unemployed because of sickness or injury that did not result from the job.

Employment Services

In many instances, the placement of tradesmen is done almost exclusively through the offices of the union. Usually, therefore, the unemployed tradesman will go first to his local union office; then, if no work is available there, he should go to the local EDD office to file for unemployment insurance and be registered for work.

State Job Assistance

The statewide EDD offices offer assistance of many kinds to job seekers, including vocational testing, counseling, and retraining as well as the bringing together of job seekers and employers. The EDD offices exchange information on job openings throughout the state, and they also form part of a nationwide network of public employment offices that exchange information on jobs throughout the country. The free services of these offices are intended for everyone, not just for persons who are claiming unemployment insurance benefits. Anyone who is looking for a job, or who wants to get a better job, can make use of them.

Unemployment Insurance Benefits

Most California workers, including those in the meatcutting trade, are covered by the provisions of the state's Unemployment Insurance Code. Employers pay all the costs of unemployment insurance (but not disability insurance) under the program. The states cooperate in a reciprocal arrangement with regard to unemployment insurance: a worker currently living in California may file his claim at any public employment office, even though his work in covered employment may have been performed in another state. Other states in turn act as agents for claims against California earnings by workers who have left California.

As soon as a covered worker becomes unemployed, he should file a claim for unemployment insurance benefits. One day's delay in filing could mean the loss of a whole week's benefits. Covered workers who are cut back from full-time to part-time employment because of a shortage of work should also check with their nearest public employment office to determine their eligibility for partial unemployment insurance benefits. After a claim has been filed, a seven-day waiting period begins; no benefits can be paid for this first week of unemployment. If the claimant continues to meet all the eligibility requirements for unemployment insurance, payments usually begin after the second week following the filing of the claim.

To be eligible for unemployment insurance benefits, the claimant must be physically able to work, available to accept work, and actively seeking work. His benefit eligibility can be affected if he voluntarily quit or was discharged from his last job; left work because of a trade dispute; refuses to take suitable work; fails to apply for a job when sent by the department or fails to do his best to find a job as directed; or makes a false statement or withholds information in making his claim.

The amount of an insured worker's weekly benefit payment is based on his earnings during the

base period on which his benefits are computed. The filing of a new claim establishes a 52-week period known as the "benefit year." Normally, no more than 26 weekly payments can be made in one benefit year.

Keeping Informed

Additional information concerning the benefits discussed in this topic may be obtained from pamphlets available free from the nearest EDD office.

UNIT H – WORKERS' LEGAL RIGHTS AND BENEFITS

TOPIC 3 – SERVICES OF THE CALIFORNIA DEPARTMENT OF EMPLOYMENT DEVELOPMENT

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The cost of unemployment insurance is paid by the _1_. — 1._____

2. To be eligible for unemployment insurance benefits, the claimant must be physically _2_ to do work, available to _3_ work, and actively _4_ work. — 2._____ 3._____ 4._____

3. A maximum of _5_ payments can be received by the claimant in a _6_-week benefit year. — 5._____

4. The first week of a claim for unemployment insurance is called the _7_ _8_. — 7._____ 8._____

5. To wilfully make a false statement or representation or to knowingly fail to report a material fact in order to obtain unemployment insurance benefits is a _9_. — 9._____

6. A claimant may be refused unemployment benefits if he _10_ _11_ his last job. — 10._____ 11._____

7. The amount of the insured worker's weekly benefit payment is based on his earnings during the _12_ _13_. — 12._____ 13._____

8. A worker who has exhausted his regular claim may be eligible to file for _14_ _15_ when insured unemployment equals or exceeds a certain percentage established by state and/or federal law. — 14._____ 15._____

9. Some unions require that their members seek work only through the _16_ _17_. — 16._____ 17._____

10. Services of the California Department of Employment Development include _18_ _19_ testing, _20_, and _21_. — 18._____ 19._____ 20._____ 21._____

TOPIC 4 – THE CALIFORNIA STATE DISABILITY INSURANCE PLAN

This topic, "The California State Disability Insurance Plan," is planned to provide answers to the following questions:

- **What is the purpose of the California disability insurance plan?**
- **What are the benefits of the California disability insurance program, and who is eligible for these benefits?**
- **Where should the worker go to obtain information in regard to services and benefits available under the California disability insurance plan?**

California is one of the few states that has a disability insurance program to help protect the labor force against the loss of wages because of unemployment resulting from nonoccupational illness or injury. Also, California pays hospital benefits to claimants hospitalized for nonoccupational illness or injury.

Disability Insurance Coverage

Workers who are covered by California unemployment insurance are also covered by disability insurance, for which a deduction is made from their pay. Disability insurance benefits are payable to eligible workers who are prevented from doing their regular and customary work by nonoccupational illness or injury. Provision is made for two kinds of disability benefits: (1) basic benefits; and (2) hospital benefits.

Basic Benefits

Disability benefits payments, like unemployment insurance benefits, are based on base-period earnings. The current range of weekly disability insurance benefits is available from any local office of the State Department of Employment Development. If the worker is paid part wages while he is disabled, he can still receive weekly disability benefits. However, wages and benefits together cannot exceed his total weekly wage prior to his disability. Also, no person may receive both unemployment benefits and disability payments at the same time.

To speed payment and avoid loss of benefits, the disabled worker should file his claim promptly. The claim form can be obtained from any Department of Employment Development office or from the claimant's doctor or hospital. The doctor's certification is required on the form. Fees for any examinations required for determining a claimant's eligibility are paid for by the Department of Employment Development. Benefit payments and certifications of continued disability are handled by mail, and checks usually are mailed every two weeks.

Hospital Benefits

If a disabled worker is hospitalized, he may be eligible for hospital benefits in addition to basic benefits. Hospital benefits are payable even if the employer continues all or part of the worker's wages during the period of disability.

Keeping Informed

Further information relating to the provisions of the California disability insurance plan can be found in pamphlet DE 2515, "Disability Insurance Provisions – State Plan," which may be obtained at any local office of the California Department of Employment Development.

UNIT H – WORKERS' LEGAL RIGHTS AND BENEFITS

TOPIC 4 – THE CALIFORNIA STATE DISABILITY INSURANCE PLAN

Study Guide

Determine the correct word for each numbered blank in a sentence, and write that word in the corresponding blank at the right.

1. The cost of disability insurance is paid by the _1_ . 1. _____

2. Disability insurance is payable when the claimant cannot work because of _2_ or _3_ not caused by his job. 2. _____ 3. _____

3. A claimant may be required to submit to an _4_ to determine his _5_ or _6_ disability. 4. _____ 5. _____ 6. _____

4. Disability insurance checks are mailed to claimants every _7_ weeks. 7. _____

5. Weekly benefits are based on wages in the _8_ _9_ of the base period in which the claimant was paid the _10_ . 8. _____ 9. _____ 10. _____

Instructional Materials

Materials Recommended for Each Apprentice

Meatcutting, Part 2 (workbook and testbook). Sacramento. California State Department of Education, 1981, 1982. (Orders to California State Department of Education, Publications Sales, P.O. Box 271, Sacramento, CA 95802. Write for price list and ordering information.)

John R. Romans and P. Thomas Ziegler, *The Meat We Eat* (Tenth edition). Danville, Ill.: The Interstate Printers & Publishers, Inc., 1974. (Orders to The Interstate Printers & Publishers, Inc., 19-27 North Jackson St., Danville, IL 61832.)

Materials Recommended for the Classroom Library

Bacteria, Yeasts, and Molds. Bulletin No. 704. Athens, Ga.: University of Georgia College of Agriculture, 1972. (Orders to University of Georgia College of Agriculture, Athens, GA 30601.)

Helgran, Fred J. *Metric Supplement to Science and Mathematics* (Revised edition). Oak Lawn, Ill.: Ideal School Supply Co., 1973. (Orders to Ideal School Supply Co., 11000 Lavergne Avenue, Oak Lawn, IL 60453.)

Hobbs, Glenn M. and James McKinney. *Practical Mathematics* (Third edition). Chicago: American Technical Society, 1973. (Orders to American Technical Society, 848 E. 58th St., Chicago, IL 60637.)

Institutional Meat Purchase Specifications. Washington, D.C.: U.S. Department of Agriculture, Consumer and Marketing Service, Livestock Division. (Orders to Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

Kramlich, W. E., A. M. Pearson, and F. W. Tauber. *Processed Meats.* Westport, Conn.: Avi Publishing Co., Inc., 1973. (Orders to Avi Publishing Co., Inc., P.O. Box 831, Westport, CT 06880.)

Lessons on Meat (Second edition). Chicago: National Live Stock and Meat Board, 1970. (Orders to National Live Stock and Meat Board, 36 South Wabash Avenue, Chicago, IL 60603.)

Levie, Albert. *Meat Handbook* (Third edition). Westport, Conn.: Avi Publishing Co., Inc., 1970. (Orders to Avi Publishing Co., Inc., P.O. Box 831, Westport, CT 06880.)

Meat Buyer's Guide to Standardized Meat Cuts (Twelfth printing). Chicago: National Association of Meat Purveyors, 1972. (Orders to National Association of Meat Purveyors, Office of the Secretary, Suite 1728, 120 S. Riverside Plaza, Chicago, IL 60606.)

Meatcutting Workbook, Part 1. Sacramento. California State Department of Education, 1981. (Orders to California State Department of Education, Publications Sales, P.O. Box 271, Sacramento, CA 95802.)

Weiser, H. H. *Practical Food Microbiology and Technology.* Westport, Conn.: Avi Publishing Co., Inc., 1962. (Orders to Avi Publishing Co., Inc., P.O. Box 831, Westport, CT 06880.)

Glossary

The definitions of terms in this glossary are those that are pertinent to the meatcutting trade and are not necessarily those found in standard dictionaries. The definitions, which are taken from the USDA Consumer Marketing Service booklet "Technical Terms of the Meat Industry," are not given exactly as shown in that publication. Some terms and definitions have been altered for the sake of simplification.

Acidophilic or lactic acid – A group of acid forming bacteria which enhance the aroma and flavor of certain types of sausage.

Added substances – A term used to refer to water plus the salt and other additives that may be present in smoked meats or other products.

Additive – An edible substance used in food mixtures for flavor, palatability, volume, or preservation, such as spices, extenders, or curing materials.

Adulteration – The addition of inferior, impure, or foreign materials.

Aerate – To expose to air or to cause air to circulate through.

Aerobic – A need for free oxygen to live and grow.

Amino acid – The component parts of protein.

Anerobic (also spelled anaerobic) – To live and grow best where there is no free oxygen or air.

Antibiotic – A soluble substance which destroys or inhibits the growth of bacteria or other microorganisms.

Antiseptic – A substance which destroys the germs of fermentation, decomposition, or disease.

Arterial pumping – A process in which a pickling solution is injected through the femoral artery of ham.

Artery – A blood vessel which carries oxygen bearing blood to body tissues.

Artificial casing – A synthetic container for sausages, loaves, and so forth.

Artificial coloring – Approved dyes used for coloring casings or the surface of sausage products.

Ascorbate – A salt compound of ascorbic acid.

Ascorbic acid – A white colorless compound found in citrus and other fresh fruits that may be made synthetically from glucose. This compound is used to accelerate the color fixation of cured meats.

Back bacon (better known as Canadian bacon) – The trimmed, pressed, and smoked boneless loin of pork.

Bacon press – A machine used to form smoked bacon and to prepare it for slicing.

Bacon square (also called jowl bacon) – The cured and smoked pork jowl, either rough cut or squared.

Baked loaf – Any loaf cooked in the oven at a temperature of at least 160° F.

Barrel pork – A pork product that is placed in a barrel with salt and salt brine.

Batch – A quantity of material needed to produce a certain amount of sausage.

Batch count – The number of batches prepared.

Berliner – Smoked and cooked unseasoned sausage made of cured pork and mildly cured beef.

Binder – A substance, such as flour, cereal, dried skimmed milk, and the like, used in sausage to hold together various ingredients.

Bladder – A membranous sac serving as a receptacle for urine and other secretions. When cleaned and dried, beef urinary bladders may be used as sausage casing.

Block – The amount of sausage chopped at one time, which is usually determined by the capacity of the chopper.

Blood sausage – A meat mixture of blood, pork, beef, fat, and spices put into casings and cooked.
Bloom – A pleasing, pale pink or fresh appearance of meat.
Botulism – Food poisoning caused by toxin produced by the bacterium clostridium botulinum.
Bratwurst – A German-type sausage usually made from pork and veal, stuffed in a wide sheep or hog casing and fried before serving.
Braunschweiger – A name applied to liver sausage. The name was taken from the German city of Braunschweig. The first Braunschweiger was stuffed into hog bungs, contained small cubes of fat, and was smoked.
Breakfast sausage – A fresh sausage made from pork and other meat products as distinguished from fresh pork sausage, which it simulates.
Brine – A water containing dissolved salt. A solution of sodium or calcium chloride used as a refrigerant.
Cacciatore salami – A small authentic Italian salami about the size of a frankfurter.
Cage – A truck or tree used for sausage or smoked meats. An enclosed area to retain meat and meat products.
Capicolla or cappocollo – A boneless pork shoulder butt cured with black or red pepper and then dried or smoked.
Capping salt – The salt placed on top of barreled meats during storage.
Case hardening – A condition that occurs in dry sausage during the drying process when the surface of the casing forms a crust.
Catalyst – A substance that causes a chemical reaction without taking part in the reaction itself.
Casings – Containers for sausage, either artificial or natural.
Cellulose – A carbohydrate used in the manufacture of artificial casings.
Certified pork – A cured or fresh pork treated for trichinae by heating to 137° F., refrigerating, and curing.
Cervelat – A German-type cold smoked sausage with a tangy flavor that is finely cut and usually stuffed in hog middles or hog bungs, either natural or sewn.
Chopper – The machine in which the emulsion for frankfurters, bologna, and so forth is finely cut and mixed.
Chorizos – A Spanish type of dry pork sausage in which the meat is coarsely cut. The sausage is highly spiced and hot to the palate.
Chub – A short, plump meat product in a casing.
Cold smoke – A low-temperature smoking process that tends to dry rather than cook. This process is usually carried out over a long period of time.
Coppa – An Italian-style boneless pork shoulder butt that is cured, air dried, and seasoned for a long period of time. This meat is sometimes peppered.
Corned beef – A cured beef, salted with or without the addition of flavoring or spices.
Corn syrup – A sweetening agent used in preparing sausages.
Corning – To preserve or pickle meat in brine or salt and/or other mixtures.
Cotto – A mildly flavored Italian cooked salami containing whole peppercorns.
Dextrose – A sugar used in the preparation of meat and meat food products.
Domestic – A product intended for sale within the United States or its possessions.
Domestic meat label (also referred to as DML) – An identification label put on boxes, cartons, drums, and so forth, of federally inspected meats.
Dried meat – The product obtained from subjecting fresh or cured meat to the process of drying, with or without the aid of artificial heat, until a substantial portion of water has been removed.
Dry cured – A curing method in which the curing agents are applied directly to the surface of the meat, which is then packed in tight boxes.
Dry sausage – A class of sausage which is hung to dry for periods ranging from one to six months.
Emulsion – The semifluid mixture of finely chopped meats, water, spices, and curing materials.
Enzyme – An organic catalyst produced within body cells of plants and animals.
Esophagus – The passageway from the mouth to the stomach.
Extender – A cereal, starch, or soy flour used in sausage emulsion to enable it to contain more water fat.

Extruder – A device which places sausage emulsion in a casing or mold.
Fish tag – A tag attached to a curing vat to record essential information on meat contained in the vat.
Fresh frozen – A term usually applied to products with less than 60 days of freezer storage.
Gassy – To be full of or containing gas or in the first stage of spoilage.
Genoa salami – An Italian type of all pork dry sausage that is usually stuffed into sewn hog bungs. It is distinguished by a cord looped around the length of the sausage from end to end.
Green room – The room in which salami and similar products are hung to dry or season before moving them into the drying room.
Green weight – The weight of ham or bacon before trimming and pumping.
Hank – A unit of hog or sheep casing.
Hog bungs – The last 3 to 6 feet of the large intestines which is used for casings.
Hog middle – The large intestines commonly used for chitterlings.
Hog rounds – The small intestines.
Horn – A tube attached to a stuffing machine through which sausage is stuffed into casings.
Hot shot cure – Slang for short cut in curing procedure. Heat is substituted for time in curing bacon, ham, and sausage emulsion.
HRI – An abbreviation or acronym for Hotel, Restaurant, and Institution.
Humidity – The amount or degree of water vapor in the air.
Hydraulic stuffer – A piston stuffer operated by the action of oil or water pressure.
Injecto cure – A method of curing meats by pumping pickle into the meat with a series of hollow needles.
Italian ham – A long cut ham that has been dry cured and pressed.
Jerked beef – Beef that has been salted and thoroughly dried.
Knackwurst – A finely ground sausage, running six to seven links to the pound, stuffed into beef middles and smoked and cooked.
Knockwurst – A class of sausage made from the same ingredient combinations as frankfurters and bologna, except that it does not contain any dry skim milk, cereal, or soy product additives. Knockwurst is made in large loaves and is usually flavored with garlic.
Loaf – A meat food product, either specific or nonspecific, prepared and processed into the shape of a loaf.
Meat by-product – Any edible part other than meat which has been derived from one or more cattle, sheep, swine, or goats.
Meat food product – Any article of food or any article intended for or capable of being used as human food.
Mettwurst – A cured, smoked sausage made mainly of pork and characterized by its soft spreading consistency.
Milano salami – A sausage similar to other salami, except that it is finely cut, spiced with garlic, and has distinctive cording.
Mortedella – A highly seasoned, finely chopped type of Italian sausage that is characterized by small cubes of pork fat. It is traditionally stuffed in a bladder, but is also stuffed in artificial casing.
Nonspecific loaf – A meat food product made in the form of a loaf with few or no restrictions as to amounts of ingredients as long as the finished product resembles a loaf.
Papain – A protein splitting enzyme obtained from the juice of unripe papaya and used as an aid to digestion. Any meat treated with this enzyme must be so labeled. It has a tenderizing effect on meat.
Pastrami – A beef product made from navel, brisket, or other cuts. It is usually cured, and then covered with pepper and spices and smoked.
Peeler – A device used to remove artificial casings from frankfurters.
Phosphate – A chemical used in meat to retain the natural juices.
Pickle – Any brine, vinegar, or spicy solution used to preserve or flavor food.
Pockets – Any jelly, air, fat, or water pockets in sausages that detract from their appearance.
Protein – A principal component of meat and meat products.

Ropy pickle – A pickle that is spoiled by bacterial decomposition and contamination.
Salmonellosis – One of the important bacterial causes of food infection or food poisoning.
Saltpeter – A potassium nitrate that is seldom used in curing pickle in the United States today.
Sewed pork bungs – Two pork bungs split lengthwise and sewn together.
Sound – A term used to denote that meat and meat products are fit to eat and are wholesome.
Specific loaf – A loaf having in its true name the words beef, pork, veal, mutton, or meat, thus indicating that it is a meat loaf.
Staphylococcus – A bacteria capable of causing a common food-borne illness. Incubation time is from one to six hours before symptoms of illness appear. Sometimes called Staph.
Starter – Cultures of selected lactic acid organisms used in the manufacture of a number of varieties of fermented sausages.
Stuffer – A device used to stuff sausage emulsions into casings.
Summer sausage – A term that usually refers to a mildly seasoned, soft cervelat, semidry sausage.
Sweet pickle – A brine containing sugar.
Tainted – A term used to denote spoilage or putrefaction that is often apparent to taste or smell.
Thuringer – A cooked, smoked, coarsely chopped sausage prepared predominately of beef with a small amount of pork and usually stuffed into large sewn hog casings.
Trichinosis – An infestation of the muscles and intestines with the larvae of trichinella spiralis, a small round worm in swine that is transmissible to man.
Vat – A metal or wooden tank, square or round, in which hams, bacon, or beef products may be placed during the various stages of processing.
Vein – A blood vessel that carries blood from parts of the body to the heart.
Weasand – A packing house term for the esophagus.
Wiener or wienerwurst – A small cooked and smoked sausage identical to the frankfurter and named after the city of Vienna, Austria. The original wiener was apparently small and sold in bunches.

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