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Product Information, Ground Beef

General Ground Beef Info

Ground beef is considered by many to be the most popular and most versatile of all beef products. It is enjoyed by young and old alike, in products ranging from ground beef patties, to meatloaf, to taco mix, to meat sauce, to chili – a seemingly endless variety of entrées.

The key to the continuing popularity of ground beef lies in both its recognized consistency as an enjoyable and economical food by consumers, as well as the foodservice industry's ability to prepare, handle and serve ground beef products in a safe and easy manner.

Production and Processing

Nothing is more critical to the quality and safety of ground beef products than the condition and subsequent handling of the raw materials that will be used in its manufacture. Manufacturers must be vigilant in monitoring incoming product, as well as its production processes. End users must carefully track product consistency, safety and consumer satisfaction of entrée items prepared from ground beef supplied by various manufacturers.

Ground beef manufacturing plants operate under the Federal Meat Inspection Program, with the USDA's Food Safety and Inspection Service (FSIS) providing monitoring of the operational procedures. Each plant is required to have a USDA-approved HACCP (Hazard Analysis/Critical Control Points) plan in place under which the production process operates.

Fresh or Frozen Raw Beef Receiving & Storing

Upon arrival, plant personnel inspect the beef to ensure it contains no visible bones or foreign material, and that it does not have an off odor. Raw materials are routinely tested for the presence of pathogens and other bacteria, and samples may be taken to estimate its composition (lean-to-fat ratio). The beef is normally stored under the same state of refrigeration in which it was received, until it's ready for grinding on a "First-In/First-Out" (FIFO) rotational basis.

Initial/Breaker Grinding

Prior to the initial grinding to produce "coarse ground" product, the beef is again visually inspected for bones or foreign matter before being placed in the grinder. Typically, the raw material will be of a leaner composition that the customer's specification dictates. The beef is initially ground through steel "breaker" plates with holes typically 1/4- to 1-inch in diameter. The size of the plate may be dictated by the refrigerated state of the raw materials used (i.e., fresh, frozen or a combination of both). The temperature is monitored and kept as close to 28°F as possible to minimize bacteria growth and to facilitate the forming of patties.

Ground beef is considered by many to be the most popular and most versatile of all beef products.

Mixing/Blending

After the initial coarse grind, the beef goes into a blender where the raw materials are mixed and blended, and any needed adjustment to the composition is made. A sample is taken to determine a more accurate lean-to-fat ratio. Since the fat content of each batch will likely vary, adjustments to the lean-to-fat ratio are made at this time to meet customer specification requirements. These adjustments are made by calculating the amount of fatter (usually) coarsely ground beef component needed to adjust the entire batch to the desired fat content. Also, depending upon the product to be manufactured, approved food additives, if any, would be incorporated at this point (i.e., salt, seasoning, binders, extenders, vegetable protein product (VPP), water, etc.). The batch is then thoroughly mixed/blended to ensure a uniform and consistent distribution of all components.

Final/Second Grinding

After mixing and blending, the beef is ground for a second time; usually this is the final grind. For a more finely ground product (used for burgers, meatballs, meatloaves), the beef is ground through smaller plates with 3/32- to 1/8-inch diameter holes. For a coarse ground (typically used for chili) larger plates may be used. Bone chip and gristle eliminators are usually incorporated into the final grinding step.

Bulk Packaging or Patty Forming

After the final grind, the product is either packaged in bulk or formed into patties. A metal detector is typically used (at this point or prior) to ensure there are no metal fragments in the finished product. Ground beef may be packaged in bulk form using various sizes of bags, or formed into patties based on specifications for thickness, size and/or weight. If specified, a textured surface may be incorporated as part of the forming process.

- Patty sizes are identified in ounces or number of patties per pound. For example, 4/1 would be four 4-ounce patties per pound; 10/1 would be ten 1.6-ounce patties per pound.
- Using equipment from a variety of companies, patties can be formed into many shapes – round, oval, square, hoagie-style or home-style/natural.
- Scoring perforates the surface of the patty immediately prior to freezing, and can be done on one or both sides. Scoring allows for faster freezing and faster, more even cooking.

Freezer Burn is dehydration (drying) of the meat, resulting from the meat surface's exposure to air in the freezer for an extended period of time. A freezer burn patty has a chalky brown surface that, if scratched, does not show the proper red or pink color immediately under the surface.

Freezing Systems

There are three basic types of freezing systems for ground beef products:

Blast Freezing

The product (usually prepackaged) is placed in a blast freezer, which uses a high velocity blast of cold air (-40°F) to speed up the freezing process. Bulk ground beef is usually frozen in this manner.

Mechanical Freezing

Mechanical freezing typically uses ammonia as the refrigerant to produce very cold air that is forced at high pressure and intensity over the individual unpackaged product. This system is used for Individual Quick Frozen (IQF) ground beef products (as is cryogenic freezing) and is extremely fast.

Cryogenic Freezing

A cryogenically freezing system passes individual ground beef patties through tunnels where liquid nitrogen or carbon dioxide (CO₂) is used as the freezing agent. Due to the low temperatures used in cryogenic freezing, the ground beef patties may have a frosty white surface, which should not be mistaken for freezer burn.

Storage

If stored at the proper temperature (below 40°F), the shelf life for fresh ground beef product that is not vacuum packaged is usually 1 to 3 days. For vacuum packaged fresh ground beef, most ground beef manufacturers recommend a 14-day shelf life (but check with your supplier for recommendations specific to your product). For optimum quality, the shelf life of frozen ground beef is generally up to 90 days under proper packaging and storage conditions (0°F or colder).

Type of Product:	Storage Temperatures:	Storage Times: <i>(from date of production)</i>
Fresh ground beef	Below 40°F and as close to 28°F as possible	1 to 3 days
Fresh vacuum packaged (unopened) ground beef	Below 40°F and as close to 28°F as possible	Up to 14 days (check with supplier)
Frozen ground beef	0°F or below	Up to 90 days
Refrigerated, cooked ground beef	Below 40°F	2 to 3 days
Frozen, cooked ground beef	0°F or below	Up to 90 days

Labeling

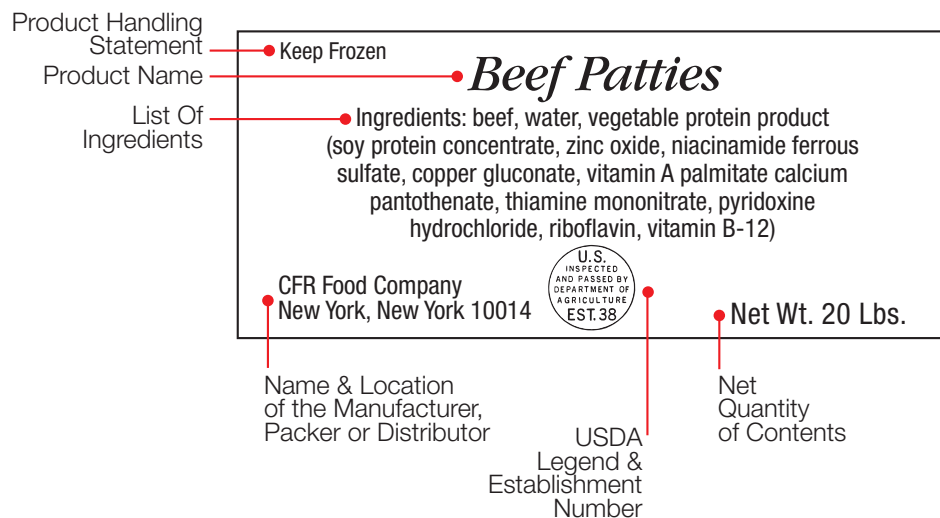
In order to be labeled “ground beef,” the product cannot contain more than 30% fat (see the “USDA Ground Beef Ingredient and Labeling Requirements” table on page 6 to determine the differences among various types of ground beef products). Boxes of ground beef are packed according to weight and number of items per box. Each box must have two types of labels affixed to it: an ingredient label and a safe food handling label.

Ingredient Label

Federal meat inspection regulations require that all fresh ground beef packages be labeled with the following information:

- Accurate name of the product
- A list of ingredients (if required) in descending order of quantity
- Name and location of manufacturer, packer, or distributor
- Net quantity of contents
- Official inspection legend
- Safe Food Handling Label
- Any other regulatory labeling requirements for the specific product

Many companies also include a tracking number and/or packaging date in case of a product recall. The portion size is also often printed on the ingredient label.





Safe Food Handling Label

To reduce the risk of foodborne illness, the USDA requires that a “Safe Handling Instructions” label be placed on all raw or partially precooked (not ready-to-eat) meat and poultry packages, including fresh ground beef packages. The label must appear as follows:

Safe Handling Instructions

This product was prepared from inspected and passed meat and/or poultry. Some food products may contain bacteria that could cause illness if the product is mishandled or cooked improperly. For your protection, follow these safe handling instructions.

-  Keep refrigerated or frozen.
Thaw in refrigerator or microwave.
-  Keep raw meat and poultry separate from other foods.
Wash working surfaces (including cutting boards), utensils, and hands after touching raw meat or poultry.
-  Cook thoroughly.
-  Keep hot foods hot. Refrigerate leftovers immediately or discard.

Types of Ground Beef Products

USDA Ground Beef Ingredient and Labeling Requirements

The official USDA requirements of beef ingredients and labeling for different types of ground beef products are established in Chapter 9, Part 319 of the Code of Federal Regulations (9CFR319), entitled, "Definitions and Standards of Identity or Composition." In some cases, these definitions are supplemented in various USDA/FSIS manuals and directives. However, the following table summarizes the ingredient and labeling requirements approved for ground beef products by the USDA.

X = Ingredients¹ allowed in these products that are not required to be listed on the label.

✓ = Ingredients¹ allowed in these products that must be listed on the label.

Category	Skeletal Muscle	Skeletal Trimmings	Head Meat Trimmings	Cheek Meat (limited to 25%)	Added Beef Fat	PDCB (PDCB: Partially Defatted Chopped Beef)	PDBT (PDBT: Partially Defatted Beef Fatty Tissue)	Edible Lean Organ Meats (Trimmed Beef Heart, etc.)	Water, Binders, Fillers, Extenders
Ground Chuck, Ground Round or Chopped Sirloin ²	X (from identified muscle primal)	X (from identified muscle primal)							
Ground Beef (also "100% Pure Ground Beef" or "Pure Ground Beef")	X	X	X	✓ ³		THESE INGREDIENTS ARE NOT ALLOWED IN THESE PRODUCT CATEGORIES			
Hamburger	X	X	X	✓ ³	X				
Pure Beef Patties (also "100% Pure Beef Patties")	X	X	X	✓ ³		X			
Pure Beef Patty Mix	X	X	X	✓ ³		✓			
Beef Patties	X	X	X	✓ ³	✓	X	✓	✓	✓
Beef Patty Mix	X	X	X	✓ ³	✓	✓	✓	✓	✓

(1) Mechanically Separated (Beef) is inedible and prohibited for use in human food, including ground beef products

(2) This category applies to any specified section of the beef carcass, including those named; "Ground" and "Chopped" may be used interchangeably

(3) If exceeds 2%

The information in this chart is derived from the USDA's "Ingredient Standard List and Labeling Requirements for Ground Beef Products" guide. It's provided for informational purposes only, to aid and assist foodservice personnel, Government Contracting Officer's Technical Representatives (COTRs) and Food Unit Leaders (FDULs) in more easily identifying and determining relative food product quality and value for the product's intended use.

Ordering Ground Beef Products

USDA standards dictate what is allowed in a specific ground beef product, and ground beef products follow the same Institutional Meat Purchase Specifications (IMPS) guidelines as other meat products. Under the IMPS numbering system, ground beef product descriptions are found in the “100 Series.”

Listed below are very brief summaries of the descriptions of several ground beef products appearing in *“The Meat Buyer’s Guide.”* When using the detailed descriptions from the MBG, the purchaser should know there is flexibility in their use. For instance, as noted for IMPS/NAMP 136 below, “Fat content, unless specified, shall not exceed 22%,” tells the user they have the option of specifying a fat level greater than 22%. In addition, when ordering ground beef, be sure to specify what size grinder plate you want used for the final grind – the standard coarse grinding plate may not result in the size pieces you want for chili, but the fine grind plate may be too small.

IMPS/NAMP 136 – Ground Beef

Prepared from any portion of a boneless graded or ungraded carcass. The meat shall be free of bones, cartilage, exposed lymph glands, heavy connective tissue and the tendinous ends of shanks. Specify regular or coarse ground. The term “coarse ground” must appear on the product label in accord with FSIS regulations. Fat content, unless specified, shall not exceed 22%.

IMPS/NAMP 136A – Ground Beef with Vegetable Protein Product (VPP)

This product is approved for use in Child Nutrition Programs and is as described in IMPS/NAMP 136 except that VPP is added. The VPP must meet the nutritional specifications established by USDA, Food and Nutrition Service Regulations, and must have information on the label.

IMPS/NAMP 136B – Beef Patty Mix

This product is as described in 136A, except the VPP does not meet the USDA-FNS requirements. Labeling is in accord with FSIS regulations.

IMPS/NAMP 136C – Beef Patty Mix, Lean

This product shall meet the raw material, processing and fat testing requirements of 136. The fat content shall not exceed 10%. Additional ingredients can be added in compliance with the FSIS regulations, but the additional ingredients cannot exceed 10% of the finished product.

IMPS/NAMP 137 – Ground Beef, Special

This product is the same as 136, except not less than 50% by weight of the product comes from any combination of boneless primal and subprimal. (Style 1 - Ground Beef, Special; Style 2 - Ground Beef, Chuck; Style 3 - Ground Beef, Round; Style 4 - Ground Beef, Sirloin)

Ground Beef Questions and Answers

Where does ground beef come from?

Raw material for the production of ground beef usually comes from one of three sources:

1. *Mature Cattle (over 30 months of age) – Boneless primals and trimmings from mature cattle tend to be less tender, making it ideal for ground beef production since the process of grinding provides tenderness to these muscles.*
2. *Fed Cattle (9 to 30 months) – Primals cut from fed (finished) cattle are usually fabricated into steaks and roasts for the retail and foodservice channels. This results in beef trimmings that can be most efficiently utilized in ground beef products.*
3. *Imported Lean Beef – Cattle raised in most countries exporting beef to the United States are raised on forages (primarily grass) and are harvested at more mature ages than U.S. cattle. Consequently, the imported boneless beef is quite lean, but generally lacks tenderness, making it ideal for use in the ground beef industry. (Note: Under USDA regulatory requirements, imported beef is subject to the same inspection standards as beef raised and harvested within the U.S.)*

Why does raw ground beef often have a two-toned color – bright red outside and a darker color inside?

Although the color of fresh ground beef normally seen in retail packages is a bright cherry-red color, it only exhibits this color when exposed to air (oxygen). Its natural color, prior to being exposed to air, is purplish-red. The interior of packaged ground beef, which has not been exposed to air following grinding, retains its darker, purplish-red color, while the outer surface may turn a bright cherry-red. Once broken open, the surface of the ground beef will turn bright cherry-red when exposed to air. A purplish-red color is also typical of vacuum-packaged ground beef, since the vacuum condition excludes air from coming into contact with the ground product.

What is IQF?

Individual Quick Frozen (IQF) is a procedure where individual patties are rapidly frozen at very low temperatures (-40°F or below) to produce small ice crystals in the frozen patty. This process locks in freshness by retaining juiciness, reduces damage to the product's cell structure, minimizes oxidation, and reduces the tendency for patties to stick together in the package. IQF patties are usually cooked from the frozen state.

What is “Partially Defatted Chopped Beef”?

Partially Defatted Chopped Beef (PDCB) is a meat product derived from the low temperature rendering of beef (not to exceed 120°F). It must have a pinkish color and a fresh odor and appearance. PDCB is not permitted in hamburger or ground or chopped beef, but is permitted in Pure Beef Patties/Patty Mix and Beef Patties/Patty Mix. The School Lunch Program requires that when PDCB is used in products like taco mix, which later may be used in preparing other products such as tacos or patties, the PDCB must always be declared in the ingredients statement on the labeling of the taco mix. “All Beef” or “100% Beef” are acceptable product names if the PDCP is declared in the ingredients statement.

Which ground beef products contain only beef and which can contain other products?

The following ground beef products must contain 100% beef according to the specifications for each category: ground round, ground chuck, chopped sirloin, ground beef, hamburger and pure beef. Beef patties or beef patty mix may contain the following ingredients if identified in the ingredient statement on the label: water, partially defatted chopped beef (must be on label for beef patty mix, not beef patties), partially defatted beef fatty tissue, beef heart meat, fillers/ extenders/binders, organ meats and pure beef fat. Ground beef or hamburger with soy products may be processed providing the product is descriptively labeled (i.e., Ground Beef and Textured Vegetable Protein, or Hamburger and Soy Protein, or Hamburger and Soy Protein Isolate).

How long can I store ground beef in the cooler or freezer? Why is the storage time shorter than steaks and roasts?

Fresh ground beef should be refrigerated as close to 28°F as possible immediately upon receipt, and used within 1 to 3 days (unopened vacuum packaged ground beef should be used within 14 days of receipt). Similarly, ground beef received in the frozen state should be placed in a freezer (0°F or below), and should retain its quality for up to 90 days if properly stored. However, once frozen ground beef is thawed, it should be used immediately. Ground beef is more perishable than steaks or roasts because, during grinding, the surface area of the beef is greatly increased, and any spoilage microorganisms present on the surface of the beef prior to grinding would be mixed throughout the ground beef, thereby shortening its shelf life.

How can operators be sure that the ground beef they serve is safe to eat?

A foodservice operator should always buy beef from a reputable source and cook to an internal temperature of at least 160°F to ensure the destruction of pathogens such as E. coli O157:H7 and Salmonella. A meat thermometer with a sensor tip should be used to test the end temperature at the center of the product on a regular basis. Check the FDA's Model Food Code at www.foodsafety.gov/~dms/foodcode.html for more information.

Why does ground beef need to be cooked to a higher internal temperature?

When beef is ground, the surface area of the meat is greatly increased. Any bacteria that are present on the outside of the meat prior to grinding will be distributed rather uniformly throughout the product as it is ground and blended. Should any pathogenic organisms be present, they likewise will be distributed throughout the ground beef batch. Therefore, ground beef products (including ground beef patties) must be thoroughly cooked to at least 160°F at the center to ensure that any potentially harmful organisms are destroyed. Since color is not a dependable indicator of degree of doneness, a meat thermometer should be used to determine the internal temperature.

Why is the center of meatloaf still pink even when my meat thermometer registers above 160°F?

The color of burgers and meatloaves may remain pink even when a 160°F internal temperature has been reached because of the natural nitrate content of certain ingredients, such as onions, celery and bell peppers. Red or brown sauces mixed into the ground beef can also interfere with color. Always check the internal temperature of ground beef products with a meat thermometer, regardless of whether these ingredients have been used or not.

How can I reduce shrinkage of ground beef patties during cooking?

To reduce shrinkage, cook ground beef patties at lower temperatures (but at a sufficient temperature to ensure that the internal temperature will reach at least 160°F). The patties should not be pressed with a spatula during cooking but rather allowed to plump naturally. Patties should be cooked evenly by turning over at least once during the cooking process.

Do patties cooked from the frozen state need to be handled differently from those cooked from a fresh or thawed state?

Yes and no. Other than the need to cook frozen patties longer than fresh or thawed patties to reach the recommend internal temperature of at least 160°F, frozen patties and fresh/thawed patties are handled in a similar manner. While frozen patties may require longer cooking times, technological improvements have reduced longer cooking times in comparison to fresh patties.

How do I determine which types of ground beef products to use for different types of entrée items?

Many factors determine the ground beef product used for specific entrées, including:

- The type of operation (i.e., school lunch, hospital, quick service, mid-scale restaurant, etc.)
- Total food cost for the entrée
- Fresh or frozen beef used
- Product price
- Juiciness needed
- Size, weight and/or shape of patty needed
- Menu price
- Taste, flavor profile
- Desired plate coverage
- Bulk or patty needed for entrée
- Cooking equipment
- Holding time

Are there any special preparation tips when working with ground beef?

Use a gentle touch when mixing and shaping meatloaves and meatballs; over-mixing can cause them to be firm and compact after cooking. Don't press burgers during cooking in order to retain flavorful juices.

What are some classic menu ideas that use ground beef?

The possibilities with ground beef are endless! Use a coarse grind for chili (Texas, Cincinnati or Colorado-Style) and a regular grind for your signature burgers, sloppy Joes and other loose meat sandwiches, in stuffed peppers and cabbage, cabbage rolls, beef pot pie, cottage pie, tamale pie, lasagna, meatloaf, meatballs, chiles rellenos, tacos and burritos and as a pizza topping.