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The content presented in this section is based on Parts 3-1 and 3-2 in the U.S. Food Code. The Food Code is available at: http://www.cfsan.fda.gov/~dms/fc05-toc.html

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The flow of food delineates the steps in the preparation of a food item from receipt to sale or service. The flow of food, also called flow chart, forms the foundation for applying the seven principles of HACCP. The significant hazards associated with each step in the flow chart should be listed along with preventative measures proposed to control the hazards. This tabulation will be used under Principle 2 to determine the critical control points (CCPs). The flow diagram should be constructed by a HACCP team that has knowledge and expertise on the product, process, and the likely hazards. Each step in a process should be identified and observed to accurately construct the flow diagram.
Examples of flow charts can be found at the end of the following Web page:
http://www.cfsan.fda.gov/~dms/fc01-a5.html

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The first line of defense in preventing foodborne illness is to obtain food from approved sources. Food should be purchased from commercial suppliers that are under proper regulatory control. The only exception to this is that fresh, whole (uncut) produce can be purchased from any source, including roadside vendors, Farmer's Market, and local gardens. Food cannot be prepared in a home kitchen that is not under proper regulatory control and then served in a food establishment.

GUIDELINES FOR SPECIFIC FOODS

Food in a Hermetically Sealed Container. Processing food at the proper temperature for the appropriate time is essential to kill bacterial spores that, under certain conditions in an airtight container, can begin to grow and produce toxin. Of special concern is *Clostridium botulinum*, a microorganism whose spores are found throughout the environment. Even slight under processing of low acid food can be dangerous because the spoilage microorganisms are killed and there are no signs to warn consumers that botulinum spores might have germinated into vegetative cells and produced their toxin. This is one reason that home canned foods cannot be served in a food establishment because the processing method has not necessarily been tested and is often not properly monitored.

Fluid Milk and Milk Products. Milk and milk products are susceptible to contamination by a variety of microbial pathogens, such as Shiga toxin-producing *Escherichia coli*, *Salmonella* spp., and *Listeria monocytogenes*. It also provides a rich medium for their growth. Pasteurization is required to eliminate pathogen contamination in milk and milk products. Unpasteurized milk and milk products cannot be used or sold in a foodservice establishment.

Fish. After December 18, 1997, all processors of fish must have conducted a hazard analysis of their operation, identified each hazard that is reasonably likely to occur, and implemented a HACCP plan to control each identified hazard. Fish must be purchased from seafood suppliers who have complied with this requirement.

Molluscan Shellfish. Molluscan shellfish include oysters, clams, mussels, and scallops. Molluscan shellfish are a potential problem because: 1) the environments in which they grow are commonly subject to contamination from sewage that might contain pathogens and to naturally occurring pathogenic bacteria; 2) they filter and concentrate pathogens that might be present in surrounding waters; and 3) they are often consumed whole, either raw or partially cooked. To minimize the risk of molluscan shellfish containing pathogens of sewage origin, State and foreign government agencies, called Shellfish Control Authorities, classify waters in which molluscan shellfish are found, based, in part, on an assessment of water quality. As a result of these classifications, molluscan shellfish harvesting is allowed from some waters, not from

others, and only at certain times or under certain restrictions from others. Shellfish Control Authorities then exercise control over the molluscan shellfish harvesters to ensure that harvesting takes place only when and where it has been allowed. Significant elements of the Shellfish Control Authorities' efforts to control the harvesting of molluscan shellfish include the following requirements: 1) containers of in-shell molluscan shellfish (shell stock) must bear a tag that identifies the type and quantity of shellfish, harvester, harvest location, and date of harvest; 2) molluscan shellfish harvesters must be licensed; 3) processors that shuck molluscan shellfish or ship, reship, or repack the shucked product must be certified; and, 4) containers of shucked molluscan shellfish must bear a label with the name, address, and certification number of the shucker-packer or repacker. Pathogens, such as *Vibrio vulnificus*, *Vibrio parahaemolyticus* , *Vibrio cholerae*, and *Listeria monocytogenes* that may be present in low numbers at the time that molluscan shellfish are harvested, may increase to more hazardous levels if they are time-temperature abused. To minimize the risk of pathogen growth, Shellfish Control Authorities also place limits on the time between harvest and refrigeration. The length of time is dependant upon either the month of the year or the average monthly maximum air temperature (AMMAT) at the time of harvest, which is determined by the Shellfish Control Authority.

To reduce the risk of illness associated with raw shellfish consumption, the Food and Drug Administration (FDA) administers the National Shellfish Sanitation Program (NSSP). The NSSP is a tripartite, cooperative action plan involving federal and state public health officials and the shellfish industry. Those groups work together to improve shellfish safety. States regularly monitor waters to ensure that they are safe before harvesting is permitted. FDA routinely audits the states' classification of shellfish harvesting areas to verify that none pose a threat to public health. Patrolling of closed shellfish waters minimizes the threat of illegal harvesting or "bootlegging" from closed waters. Bootlegging is a criminal activity and a major factor in shellfish-borne illnesses. Thus, molluscan shellfish must only be purchased from certified dealers that adhere to NSSP controls.

Wild Mushrooms. Over 5000 species of mushrooms grow naturally in North America. Most have never been tested to determine their toxicity. It is known that about 15 species are deadly and another 60 are toxic to humans whether they are consumed raw or cooked. An additional 36 species are suspected of being poisonous, whether raw or cooked. At least 40 other species are poisonous if eaten raw, but are safe after proper cooking. Some wild mushrooms that are extremely poisonous may be difficult to distinguish from edible species. In most parts of the country there is at least one organization that includes individuals who can provide assistance with both identification and program design. Governmental agencies, universities, and mycological societies are examples of such groups. If a food establishment chooses to sell wild mushrooms, management must recognize and address the need for a sound identification program for providing safe wild mushrooms. The following guidance is provided regarding the identification of wild mushrooms. A food establishment that sells or serves mushroom species picked in the wild shall have a written buyer specification that requires identification of:
1. The Latin binomial name, the author of the name, and the common name of the mushroom species,
2. That the mushroom was identified while in the fresh state,
3. The name of the person who identified the mushroom,
4. A statement as to the qualifications and training of the identifier, specifically related to mushroom identification.
Additional information can be found on the California Poison Control web site.

Game Animals. The primary concern regarding game animals relates to animals obtained in the wild. This is important because wild animals might be carriers of viruses, rickettsiae, bacteria, or parasites that can cause illness in humans. Some of these diseases can be very severe. In addition to the risk posed to consumers of game that is not subject to an inspection program, there is risk to those who harvest and prepare wild game because they may contract infectious diseases such as rabies or tularemia. Wild game animals might be used or served in a food establishment if the supplier has a regulatory inspection program in place to ensure that wild animal products are safe.

SOURCE: Adapted from Annex 3: Public Health Reasons of the U.S. Food Code. The Food Code can be found in its entirety at: http://www.cfsan.fda.gov/~dms/fc01-toc.html

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Transportation (delivery) vehicles need to be clean and sanitary. Dirty vehicles can contaminate food with harmful microorganisms. Foods should not be shipped in vehicles that have carried live animals or harmful substances. If these trucks must be used, they must be thoroughly washed, rinsed, and sanitized before they are used to transport food. Temperature-controlled vehicles must be at the proper temperature.

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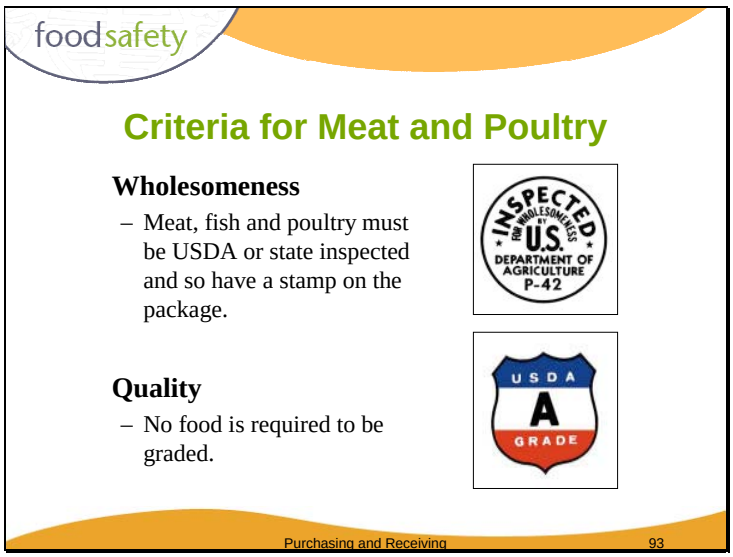

Wholesomeness
All meat processed in plants which sell their products across State lines must, under Federal law, be inspected for wholesomeness by USDA's Food Safety and Inspection Service. This mandatory inspection program is paid for by tax dollars. Many States operate their own inspection program for plants that produce meat for sale within State lines. These programs must be certified by USDA as equal to the Federal program. Federal and State inspectors supervise the cleanliness and operating procedures of meat packing and processing plants to make sure meat is not contaminated or adulterated. Meat that has passed Federal inspection for wholesomeness is stamped with a round purple mark, "U.S. INSP'D & P'S'D." The mark is put on carcasses and major cuts, so it might not appear on such cuts as roasts and steaks. However, meat that is packaged in an inspected facility will have an inspection legend which identifies the plant on the label.

Quality
Quite apart from the wholesomeness of meat is its quality -- its tenderness, juiciness, and flavor. Consumers can be assured of always getting the quality of meat they expect by looking for the USDA grade shield on raw meat packages. The shield-shaped USDA grade mark is a guide to the quality of meat. It's also your assurance that the meat is wholesome because only meat that has first passed inspection for wholesomeness may be graded. USDA's quality grading program is voluntary and paid for by user fees.

USDA's Meat Grading Program
USDA has quality grades for beef, veal, lamb, yearling mutton, and mutton. It also has yield grades for beef, pork, and lamb. Although there are USDA quality grades for pork, these do not carry through to the retail level as do the grades for other kinds of meat. USDA meat grades are based on nationally uniform Federal standards of quality. They are applied by experienced USDA graders, who are routinely checked by supervisors who travel throughout the country to make sure that all graders are interpreting and applying the standards in a uniform manner. A USDA Choice rib roast, for example, must have met the same grade criteria no matter where or when you buy it. When meat is graded, a shield-shaped purple mark is stamped on the carcass. With today's close trimming at the retail level, however, you may not see the USDA grade shield on meat cuts at the store. Instead, retailers put stickers with the USDA grade shield on individual packages of meat. In addition, grade shields and inspection legends may appear on bags containing larger wholesale cuts.

Using USDA Meat Grades

Because many cuts of meat -- such as steaks, chops, and roasts -- are labeled with a USDA grade, you don't have to be a meat expert to identify the quality you want. Just look in the meat counter or case until you find the cut you want. Then, look for the USDA quality shield on the package to make sure you're getting the quality you want. Some meat counters may contain meat that isn't USDA graded. Instead, it may be labeled with a company's private quality label or sold without a grade. Where this occurs, you will need to become familiar with the purchase specifications of each company to be sure of the quality you are buying. Sometimes a store will advertise that it sells USDA-graded meat, but the individual packages don't bear a USDA grade shield. When this happens, you can ask to see some of the boxes of untrimmed wholesale cuts to determine if the meat has actually been graded by USDA and what the quality is.

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Accurate records that are maintained in a manner that allows them to be readily matched to each lot of shell stock provide the principal mechanism for tracing shell stock to its original source. If an outbreak occurs, regulatory authorities must move quickly to close affected growing areas or take other appropriate actions to prevent further illnesses.

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ACTIVITY INSTRUCTIONS: Have participants tell you if the following foods should be accepted or rejected. Have them explain why they would accept or reject the product. The instructions are available at: http://www.foodsafetysite.com/resources/pdfs/foodservice/pu-acceptreject.pdf Additional activities to support the content presented in this section are available at: http://www.foodsafetysite.com/foodservice/conducting/purchasing/